THE IRON TRADE REVIEW

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Heavy Pig Iron Buying Stimulates All Markets

And Causes Better Feeling—Negotiations Quietly Conducted—Car Shortage Causes Much Embarrassment

The heavy buying of pig iron by the Steel Corporation and independent companies has had a decidedly stimulating effect on not only pig iron, but also on finished lines and old material. Optimism prevails and there is a general feeling that this great country is getting ready to do business on a large scale without much regard for the actions of politicians.

There is much complaint about shortage of cars and some companies are being seriously embarrassed by failure to deliver their products. The shut-down of some mills for this reason seems probable.

Pig Iron

A great deal of the pig iron buying has been done quietly and this is a good indication because it shows that the buyers expect to make further purchases and are fearful that announcement of their buying will advance prices. Of the 105,000 tons of Bessemer purchased by the Youngstown Sheet & Tube Co., 20,000 tons were purchased several weeks ago. Likewise in the case of the Algoma Steel Co., it has just leaked out that that company purchased 15,000 tons of basic several weeks ago and also bought a round tonnage of Bessemer. Weather conditions have been extremely severe at the Sault Ste. Marie, and it believed that the Algoma company will find it necessary to buy a larger tonnage at a not far distant date. The known purchase of the Steel Corporation amounted to 25,000 tons of Bessemer. It is understood that a larger tonnage of Bessemer and basic will be bought, if indeed it has not already been contracted for. Buying of steel-making irons has had a tendency to advance prices of basic and Bessemer, and to cause increased firmness in foundry grades. There has been, however, no special activity in foundry iron, although there has been a fair amount of buying. In the Metropolitan, New England and New York state territory, probably 30,000 tons of foundry, basic, malleable and low phosphorus grades are pending. The New York Air Brake Co. has closed for a part of the 6,000 tons of foundry grades, for which it has been inquiring. The General Electric Co. has inquired for 2,800 tons of high-silicon foundry iron for Lynn, Mass., and 2,275 tons of low-phosphorus for Everett, Mass., for last half.

Iron Ore

Ore handling charges on Lake Erie docks are to be reduced about one-half. It is probable that the new charge will be 7 or 8 cents, compared with 15 cents during the last two years. Owing to the marvelous increase in efficiency of unloading machines, the 15-cent charge has become excessive. The new freight rate from the head of the lakes will probably be 55 cents, and, if the unloading charge is cut to 8 cents and the freight rate to 55 cents, the net gain to the vessels will be 2 cents per ton; or, on a movement of 40,000,000 tons, an increase of $800,000 in receipts, while the ore shippers would save 5 cents per ton, or $2,000,000. This change is more important than appears at first glance, as it indicates a much more equitable arrangement not only as to the relations of the vessels and the docks, but also as to those of different competing steel companies which under the new arrangement will be working upon a more equitable basis than in past years, and no one will have an unfair advantage because of ownership or control of dock facilities.

Finished Material

In finished materials, there is a much firmer tone and a tendency toward higher prices. A striking feature of the situation is the positive evidence that in many cases buyers' stocks are reduced to very low points and there is imperative need of prompt deliveries. New wire business is heavy and specifications liberal. Sheet prices are firmer, especially for galvanized, but there are still some soft spots. Many contracts for plates, shapes and bars expire April 1, and consumers are being notified that unless they specify, contracts will be cancelled. The plate situation is much firmer. The normal spring increase is appearing in tubes and prices are firmer than during the past six weeks. Leading companies are adhering to 1.15c, Pittsburgh, as the minimum on plates and shapes, and 1.10c on bars. Railroad spikes have been advanced $1. Foreign consumers continue to call upon American producers to fill shortages of crude steel. A leading independent mill has sold an English buyer from 12,000 to 15,000 tons of re-rolling Bessemer billets.

PITTSBURGH

Entire Market is Stronger and Healthier

Office of THE IRON TRADE REVIEW, 2148-49 Oliver Bldg., March 12.

With sales of 140,000 tons of Bessemer and basic pig iron recorded during the past week, and inquiries out for additional tonnage; prices stronger in plates and shapes; indications of heavy buying of steel cars by railroads in the immediate future and a generally stronger tone to other finished lines, the Pittsburgh market finds itself in a somewhat excited state. Coke prices continue to show signs of climbing and the low point on furnace coke has gained 30 cents in a single week. Foundry grades have also gone up rapidly. Contract coke is almost impossible at this time. There is a quieter movement in the pipe market, though specifications are heavy and inquiries for much line pipe are coming out from week to week. The entire market from a Pittsburgh viewpoint is stronger and healthier than for some time.

Pig Iron.—The pig iron market for the past week, changed from one of a more or less sluggish attitude to unusual activity. Sales of Bessemer reaching 140,000 tons followed by some round lots of basic from more or less unexpected quarters, stimulated the entire market, and pegged prices higher over most of the list of pig iron grades. The Youngstown Sheet & Tube Co.'s purchase of 105,000 tons of Bessemer, is for delivery through the third quarter. The Republic Iron & Steel Co.'s purchase of 10,000 tons is for second quarter delivery, and the 25,000 tons of Bessemer for the Steel Corporation interests is for delivery during April and May. While this has fairly cleared up the Bessemer iron situation, there is still spot Bessemer to be had, and this fact has held a check upon any tendency to a sharp advance, but with inquiries now in the market for lots of 100 to 1,000 tons, and sales of equal amount at $14.25 valley, the market has firmly established itself. Anything below that price would have to be induced by a much larger order than has appeared since these large ones referred to. The inquiries for basic have been equally interesting, and some round lots have been sold at advancing prices. An inquiry for 10,000 tons for Pittsburgh delivery came out late this week. Sales at the close of the week in lots of 2,000 to 5,000 tons were made at $13, valley, and some furnaces are asking $13.25 for iron delivered after May 1. An inquiry for 3,000 tons of basic for an Ohio consumer is in the market this week for April delivery, and a considerable number of inquiries for less tonnage, are also appearing. The influence of these sales has been to stimulate malleable, and in small lots malleable has been going at $12.75 to $13, during the week. Furnaces running on No. 2 foundry, have withdrawn their quotations, are holding out for better than $13 for anything from this time forward, and the bulk of the business is moving at $13.25. The demand for gray forge is quiet, although some fair sized lots have been selling at $13.40, Pittsburgh, showing that this grade is also under the general influence of more brisk buying than has marked the iron market for some time. The Jones & Laughlin Steel Co. has added an additional stack to its active list at Aliquippa, leaving but one furnace of this company idle at that point.

The Algoma Steel Co., of Sault Ste. Marie, Ont., has made a purchase of basic amounting to 15,000 tons, and also a round tonnage of Bessemer. Details as to these transactions have not been announced. While there has been much secrecy as to price, on the larger sales of Bessemer iron, the bulk of the business appears to have gone at $14, valley, with exception of the larger sale of 105,000 tons, which was at a shade below this figure. The rapid advance in the price of coke, together with this activity in the pig iron movement, is having a strong influence toward better prices which is likely to continue for some time, because of the increased consumption of pig iron, and a lessening ability on the part of furnaces to make their normal output, due to their shortage in coke supply. We quote the market as follows:

(Prompt Shipment.)

Bessemer, valley	$14.25
Bessemer, Pittsburgh	15.15
Basic, valley	13.00
Basic, Pittsburgh	13.90
No. 2. foundry, Pittsburgh	14.15
Gray forge, Pittsburgh	13.40
Malleable, Pittsburgh	13.65

(Second Quarter.)

Bessemer, valley	$14.25
Bessemer, Pittsburgh	15.15
Basic, Pittsburgh	13.65
No. 2 foundry, Pittsburgh	14.15
Gray forge, Pittsburgh	13.40
Malleable, Pittsburgh	13.65

Ferro-Alloys.—A stronger tone to the market for ferro-manganese has developed during the past week following a brief interval during which some middle-men sought to close out small lots at a slight shading of $41, Baltimore. There are now practically no offerings for $41. A sale noted in the Pittsburgh territory for a car load a week ago at $41, Baltimore, was only secured on the plea that negotiations had been under way prior to the withdrawal of quotations. Fifty per cent ferro-silicon is firm at $70 to $71, but sales are few and in small lots. Domestic grades are quiet and unchanged in price.

We quote ferro-manganese nominally at $41, Baltimore, for prompt and forward delivery. The freight rate from Baltimore to Pittsburgh is $1.95 per ton.

Fifty per cent ferro-silicon is quoted nominally at $70 to $71, Pittsburgh, for prompt and forward delivery; 12 per cent, $22; 11 per cent, $21; 10 per cent, $20, f. o. b. Globe, Jisco and Ashland furnaces. The freight rate to Pittsburgh is $1.90. The foreign grades are held at $1 or more a ton over domestic prices.

Plates.—There has been a marked improvement in the steel plate trade during the past week. Eastern mills that have been competing somewhat sharply for business have withdrawn their low quotations, and there is apparently no business going at 1.10c in Pittsburgh or competing territory. Some eastern plants have put the minimum firmly at 1.20c, while others sell at 1.15c, holding to the same base as the leading interest in this line. While there is a good run of specifications at mills, and operations are on full capacity schedules, the past week has developed no definite contracts for plates, but inquiries are in hand for 2,000 tons of plates for a riveted pipe line for a sewage disposal plant at Rochester, New York. A number of smaller contracts and one for 1,850 tons of plates and rivets were placed with the Jones & Laughlin Steel Co. for Panama canal work, and there are a number of feelers out for some very large car orders, that promise an

early development. Among these is a tentative inquiry for from 10,000 to 12,000 cars for the Baltimore & Ohio railroad, and the announcement that the Western Maryland, which has been holding in abeyance its inquiry for 2,750 cars of various types and for early delivery, may increase its order to 8,000 cars. A western road is also said to be a prospective buyer for from 5,000 to 6,000 cars. The general situation as far as the plate market is concerned, is much improved, and prices are stronger through the elimination of the extreme low prices that have disturbed the eastern sections. Additional inquiry for ship plates has been indicated by local mills, and it is believed that the activity in the ship building industry has been responsible for filling up a vacant space in the capacity of eastern mills. We quote the market as follows:

Tank plates, ¼ inch thick, 6¼ to 100 inches, 1.10 to 1.15c. Extras are as follows, per 100 pounds: Boiler and flange steel plates, 0.10c; A. B. M. and ordinary firebox steel plates, 0.20c; still bottom steel, 0.30c; marine steel, 0.40c; locomotive firebox steel, 0.50c; all sketches excepting straight taper plates varying not more than 4 inches in width at ends, narrowest end being not less than 30 inches, 0.10c; circles, 0.20c. Plates in widths over 100 inches up to 110 inches, 0.05c; over 110 inches up to 115 inches, 0.10c; over 115 inches up to 120 inches, 0.15c; over 120 inches up to 125 inches, 0.25c; over 125 inches up to 130 inches, 0.50c; over 130 inches, 1c. Gages under ½ inch to and including ⅜-inch plate on thin edge, 0.10c; under ⅜ and including No. 9, 0.25c. Five cents extra for less than carloads. Terms net cash in 30 days.

Sheets.—The Pittsburgh market for sheets is slightly firmer in tone, and a considerable portion of such new business as is going is being done at from $1.80 to $1.85 for No. 28 gage black sheets. While a still firmer price is maintained for galvanized, the best done during the past week is at a $2.85 base, f. o. b. Pittsburgh. Specifications in the hands of the mills are very heavy. The leading interest reports a continuance of the remarkable demand of consumers, and the chief concern is to get shipments out promptly, with the handicap of car shortage both for shipments and raw material. Independents are in the same position as to cars, and seem to be operating at about the same ratio. There are still some reports of sheets going as low as 1.75c, Pittsburgh, for No. 28 black, but west of this district. This situation has become more local in its application, and has less influence on the general market. Some business is reported for prompt shipment at the nominal price of 1.90c for black sheets, and 2.90c for galvanized. We quote the market as follows:

Blue annealed sheets No. 10 gage, 1.35c to 1.40c; black annealed sheets No. 28 gage, 1.80c to 1.85c; galvanized sheets, No. 28 gage, 2.85 to 2.90c; painted roofing sheets, $1.35 per square for No. 28 gage, 2½-inch corrugation; galvanized roofing sheets, $2.45 per square for No. 28 gage, 2½-inch corrugation, f. o. b. Pittsburgh.

Tin Plate.—Specifications are heavy for tin plate, and prices are nominally the same as a week ago. They are, sentimentally, a little firmer, owing to the fact that the larger orders which caused keen competition have been disposed of, and there is less inducement for low prices. There is scarcely enough new business in the market to test its strength, but some small sales are reported during the past week at $3.35 per base box, but the majority of the markers are standing firm at $3.40, as they are fairly well supplied with tonnage for some time. We quote the market as follows:

Coke tin plate, 100-pound basis, 14 x 20, $3.35 to $3.40, f. o. b. mill, Pittsburgh district.

Rails and Track Material.—There is a continued improvement in specifying against contracts recently placed by railroads for standard section rails. The mills are running on a better schedule than for some years, and prospects are bright for one of the best records of production ever made by the enlarged rail department of the leading interest, for March. New contracts for considerable tonnage have been placed, and there is much more in prospect for eastern railroads within the next few months. The demand for light rails has shown an upward tendency, with firmer prices than a week ago. The advance in scrap has affected this market sharply and caused re-rolling rail mills to stiffen their prices as a result. The volume of business for March thus far exceeds February by a good margin. Track material is moving without change. Buyers are specifying with regularity on spikes and spliced bars, the improvement being mainly in the west where heavy shipments are now going. The market is quoted as follows, with the base price on open-hearth steel rails 1.34c per pound at the mills:

Fifty-pound and heavier, 1.25c per pound; carloads and less than 500 tons, 1.34c per pound; light rails on base weight of 40 to 45 pounds, 1.16c, the schedule on the other weights being irregular and subject to negotiations; angle splice bars for standard sections, 1.50c, Pittsburgh; track bolts, 2.20c to 2.25c, Pittsburgh.

Railroad Spikes

4½, 5 and 5½ and 9-16	$1.40
3, 3½, 4, 4½ and 5 x ½	.10
3½, 4 and 4½ x ⅝	.20
3, 3½, 4 and 4½ x ⅜	.30
2½ x ⅜	.40
2½, 3 and 3½ x ⅝	.60
2 x ⅝	.80

Steel.—Semi-finished steel mills are still well supplied with specifications and considerable new business is being taken, the average of which has been placed on the basis of $20, Pittsburgh, for open-hearth and Bessemer rolling billets, and $21 for open-hearth and Bessemer sheet bars. Some sales have been made, however, at a shade off this price, especially for open-hearth sheet bars in lots of 500 tons and less, by producers who had surplus stocks beyond their own requirements. One sale of this character in the past week was reported at $20, for sheet bars f. o. b. Pittsburgh mill. Sales of sheet bars in large lots for forward delivery are reported at the market price by Pittsburgh makers, but for exceptional contracts, there has been a shading of from 25 cents to 50 cents on both billets and sheet bars, from points west of the Pittsburgh district, and it is believed that the same inducements will be made on tonnages equal to these for the immediate future. The leading interest is still out of the market, and independent producers report business as exceptionally active, and with very little surplus tonnage available for shipment for some time ahead, owing to the liberal specifications by consumers against existing contracts. Forging billets are selling for $28, Pittsburgh, and firm at this price, but a lower price is said to be possible in the eastern market, by eastern mills. We quote the market as follows:

Bessemer 4 x 4 billets with 0.25 carbon and less are quoted at $19.50 to $20, with the usual extras for size and analysis, and open-hearth rolling billets, $19.50 to $20; Bessemer sheet and tin bars are quoted at $21, and open-hearth sheet bars are quoted at $20.50 to $21, f. o. b. Pittsburgh, with full freight to destination added. Forging billets are quoted at 27 to $28, Pittsburgh.

Hoops and Bands. — The demand upon the mills for shipments of hoops and bands continues quite active, and such new business as has come out, has indicated no change in the attitude of the market, business with some attractive features, and for prompt shipment, going at 1.30c, Pittsburgh, while the average run of buying is fairly steady at 1.35c, Pittsburgh, for prompt shipment or on forward deliveries. We quote the market as follows:

Hoops in carload lots, 1.25c to 1.30c, Pittsburgh; in less than carload lots, 1.40c; bands, 1.15c, base, with net extras, as per standard steel.

Merchant Bars.—Specifications continue fairly satisfactory and there is some new tonnage in sight, which has caused more or less speculation as to how firm the market will develop in face of competition, especially in the

cast. Indications from this point are that the mills are fairly well tried out, and will likely resist efforts to hammer down values below 1.10c, Pittsburgh. The leading interest continues to quote 1.10c on attractive orders to 1.15c on small tonnage, and current trade appears to be limited aside from one or two orders at exceptional tonnages that are in prospect. The steel shafting market has felt the effect of improved buying in the automobile trade. Other buying is very quiet. Most new business is being placed for forward delivery. Specifications are heavier than for some time, possibly exceeding any period in over a year. Prices are nominally unchanged, although any attractive orders, it is believed, might develop a weakness in the present market. We quote the market as follows:

Common iron bars, 1.30c, Pittsburgh; Bessemer and open-hearth steel bars, 1.10 to 1.15c; plow and cultivator, 1.25c; channels, angles, zees, tees, under 3 inch, 1.25c, all f. o. b. mill. The following differentials are maintained on steel: Less than 2,000 pounds of a size, 0.35 advance. Cold rolled and ground shafting, 65 per cent off in carloads and 60 and 10 per cent in less than carloads, delivered in base territory.

Muck Bar. — There is very little change in the market for muck bar, although some mills report a more liberal specifying against contracts by consumers. Such new business as is coming out is not sufficient in volume to really test the market, and nominally it remains unchanged. We quote $28 to $29, Pittsburgh.

Structural.—So far as the Pittsburgh district is concerned, the structural market has been very quiet. While makers are showing a firmer tone as to prices, erecting companies claim that some pretty low figures have been quoted for such business as is going. Larger eastern mills are quoting 1.20c on shapes, and Pittsburgh mills are holding to this price generally, and declining anything lower. One contract placed for about 800 tons, for additions to the H. K. Porter Locomotive Works, in Pittsburgh, went to the American Bridge Co., and there have been a number of minor contracts, which in the aggregate are not important. Some business is still pending locally, there being some delay in the awarding of contract for the East End Savings & Trust Co.'s office building, Pittsburgh, which is now believed to be due by the end of the week. Practically no bridge work has appeared. Some inquiries are out which are expected soon to have a slightly better effect on the structural market, than has been felt for some time. We quote the market as follows:

Beams and channels, 15 inches and under, zees, 1.15c; tees, 1.15c; angles, from 3 to 6 inches, 1.15c; over 6 inches, 1.25c; universal and sheared 1.15c to 1.20c; over 15 inches, 1.25c to 1.30c. plates, 6¼ inches wide and wider, 1.25c.

Merchant Pipe.—There is a very strong run of specifications against contracts in merchant pipe. The aggregate of small orders is still satisfactory, and above that of February, at the larger mills. There are pending some good orders for line pipe, in larger sizes, inquiries for which, have been out for a week or more. A further inquiry for about six miles, small sizes, of oil country pipe is in hand this week for southwestern fields. A larger inquiry for about 75 miles of 10, 12 and 16-inch pipe from a local gas company is expected to be placed in the maker's hands during the present week. A second inquiry that has been in the market for two or three weeks is likely to appear again in more definite form within the next week. The market for iron pipe has been strong for some time past, especially for galvanized pipe, and this week an advance has been made by the manufacturers of from one to four points on the smaller sizes. Galvanized products are generally stronger owing to the increased price of spelter. We quote the official discount to jobbers subject to the usual preferential discount to larger buyers:

Iron and Steel Pipe Basing Prices

	Steel.		Iron.	
	Butt weld.			
	Black.	Galv.	Black.	Galv.
⅛, ¼ inch.....	74	54	68	48
⅜ inch	75	65	69	53
½ inch	78	68	72	59
¾ to 1½ inch.....	81	73	75	64
2 to 3 inches.....	82	75	76	65
	Lap weld.			
2 inches	79	72	72	63
2½ to 4 inches.....	81	74	74	66
4½ to 6 inches.....	80	72	73	65
7 to 12 inches.....	77	68	71	61
13 to 15 inches.....	55	..	47	..
Extra Strong, Plain Ends.				
	Butt weld.			
⅛, ¼, ⅜ inch.....	70	60	65	55
½ inch	75	69	70	63
¾ to 1½ inch.....	79	73	74	65
2 to 3 inches.....	80	74	75	66
Extra Strong, Plain Ends.				
	Lap weld.			
2 inches	76	70	71	63
2½ to 4 inches.....	81	74	74	66
4½ to 6 inches.....	77	71	72	65
7 to 8 inches.....	70	60	65	55
9 to 12 inches.....	65	55	60	50
Double Extra Strong, Plain Ends.				
	Butt weld.			
½ inch	65	59	60	52
¾ to 1½ inch.....	68	62	63	55
2 to 3 inches.....	70	64	65	57
Double Extra Strong, Plain Ends.				
	Lap weld.			
2 inches	66	60	61	52
2½ to 4 inches.....	68	62	63	57
4½ to 6 inches.....	67	61	62	56
7 to 8 inches.....	60	50	55	45

Plugged and reamed pipe is furnished at 2 points higher price, either butt or lap weld.

The above discounts are for full weight pipe, subject to a variation of 5 per cent, merchant pipe, when specified, being furnished up to 6 inches at one point higher discount (lower price.)

Boiler Tubes. — The demand for boiler tubes has continued very satisfactory, with new business limited in volume, and specifications have improved over a week ago. The general improvement is particularly in locomotive boiler tubes, which have grown more active owing to increased activity in the locomotive building trade. Shipments are larger from the mills, and some future inquiry is developing in the shipbuilding trade. The official discount on steel and charcoal iron boiler tubes follows:

Steel

1¼ to 2¼ inch.....	65
2½ inch	67½
2¾ to 3¼ inch.....	72
3¼ to 4½ inch.....	75
5 and 6 inch.....	67½
7 to 13 inch.....	65

Charcoal Iron

1½ inch	48
1¾ to 2¼ inch.....	50
2½ inch	55
2¾ to 5 inch	60

To destination east of Mississippi river will be sold at delivered discount for carloads lowered by 2 points, for lengths 22 feet and under; longer lengths, f. o. b. Pittsburgh. Usual extras to jobbers and boiler manufacturers.

Wire Products.—An improvement in specifications against contracts placed at the advanced price of wire products affected in March, has been reported by the larger producers. There is still some running on the $1.50 base for wire nails, but this business is about cleaned up. Some of the producers reported a fairly good demand on contracts at $1.55, which will likely continue throughout the next 30 days, and sales are being made at present on the $1.60 base, for forward delivery, though in much smaller volume, because it is too early to test out the ability of the manufacturers maintaining the higher schedule. We quote the market as follows:

Wire nails, jobbers, carload lots, $1.60; retailers' carload lots, $1.65; cut nails (western makers), jobbers' carload lots, $1.55 to $1.60, painted barb wire, jobbers' carload lots, $1.60; retailers' carload lots, $1.65 with 30c for galvanizing; plain wire to jobbers in carloads, $1.40; and to dealers, in carloads, $1.45; polished staples, $1.60; galvanized staples, $1.90.

Wire Rods.—The demand for wire rods continues on a par with the running contracts on wire products, and consumers are taking liberally of contract obligations. Wire rod manufacturers who have a surplus tonnage above their own requirements are accepting new business for forward delivery at $26, and for prompt shipment $25.50 is still being done. We continue to quote $25.50 to $26, Pittsburgh, for Bessemer and open hearth wire rods.

Coke.—The coke market is in an excited state, with each week witnessing a further advance in the price of spot coke, for both furnace and foun-

dry use, and the elimination of contract sales from the market because of the tremendous demand for prompt shipment coke. Owing to the abnormal price for coal, some of the smaller coke operators have turned their coal direct into cars, and are able to get better prices than by coking it. Sales of coal have been made this week as high as $2, f. o. b. mine. There has been considerable business in coke going. Furnace grades started in at $1.90 at the close of last week, and reached $2.10 to $2.25, ovens, this week, with prospects of a further advance in the near future. Foundry coke is quoted at $2.75 for prompt shipment for standard Connellsville product. Some sales were made at $3, but were special, and not fair to assume as having a bearing on the market. Some contracts have been under negotiation at prices offered for spot coke. Coke producers have declined finally to accept them in view of the present conditions and believe that the situation will increase in severity by shortage in both coal and coke during the next three months. There is less than 20,000 tons available of spot furnace coke in the Connellsville region for the period ending June 30. Some of the furnaces now using Connellsville coke for their own ovens have been trying to accumulate stocks, but without success, even by entering the market at higher prices. There is still a severe shortage in box cars for foundry coke shipment. Production last week showed a gain over the prior week of 4,757 tons. This is divided almost eqully between furnace and foundry coke. We quote standard Connellsville furnace coke for prompt shipment at $2.10 to $2.25, ovens, and contract, $2.10 to $2.25, ovens. On high grade Connellsville foundry coke for prompt shipment, $2.60 to $2.75, ovens, and contract at $2.40 to $2.75, ovens. The Connellsville *Courier* for the week ending March 2, reports 30,947 ovens active with a production of 396,010, as compared with 30,736 ovens active with a production of 391,253 tons for the previous week.

Old Material.—While there is a lot of excitement existing in the market for old material, especially for heavy melting steel, important new business has been confined largely to one sale of about 4,000 tons, placed by the Steel Corporation for delivery in Pittsburgh and Sharon. The influence of this unexpected buyer was all but electrical in effect, and the scrap market responded with alacrity, from its low point that has been running for some weeks. Since this sale, however, the market has been quiet, and new business is restricted to small lots, which have been taken, however, at the advanced price asked by dealers. There are more inquiries afloat from large consumers. Buyers who had running contracts are taking their tonnage promptly, showing a disposition to accumulate all they can, in view of possible enlarged requirements. Heavy melting steel prices have advanced from 50 cents to 75 cents, and is quoted at $12.75 to $13.25. Bundled sheet scrap advanced 50 cents a ton, that is, from $11 to $11.50. Machine shop turnings gained 50 cents, or from $9.75 to $10.25. Cast borings advanced to $9.50 to $9.75. We quote gross tons delivered in the Pittsburgh district, including Monessen, Steubenville, Brackenridge and Follansbee, as follows:

Heavy melting scrap	$12.75 to 13.25
Rerolling rails	12.75 to 13.00
Malleable	12.00 to 12.50
Bundled, sheet scrap	11.00 to 11.50
Iron axles	21.00 to 21.50
Old iron rails	15.00 to 15.50
Stove plate	9.00 to 9.50
No. 1 wrought scrap	12.50 to 13.00
Old car wheels	12.50 to 13.00
Low phosphorus	15.00 to 15.50
Machine shop turnings	9.75 to 10.25
Cast borings	9.50 to 9.75
No. 1 cast scrap	12.50 to 12.75

CHICAGO

Prices of Finished Steel Somewhat Firmer

Office of THE IRON TRADE REVIEW,
1328 Monadnock Blk., March 12.

As a result of well-sustained specifications, prices of finished steel are a little firmer. Local mills are selling shapes and plates at prices ranging from 1.30c to 1.35c, Chicago, and the market on bars is quotable from 1.25c to 1.33c. The business now coming to the makers is well diversified and railroad buying is on a more liberal scale. A strong effort is being made to advance prices on galvanized sheets on account of the high price of spelter. The Chicago scrap market is perceptibly stronger, due largely to sentimental influences.

Pig Iron.—The western pig iron market is drifting along easily and displays no special features at the present time. The following furnaces in this territory are now in blast on foundry iron: One at the Federal works; one Iroquois; one Bay View; one Thomas and two Mayville. This represents 46 per cent of the available capacity, there being 13 furnaces in the district. It is evident, therefore, that little in the way of price improvement can be expected until the demand increases to much more liberal proportions. There is a fair run of small inquiries. On an inquiry for several hundred tons of 3 per cent silicon iron, a Chicago foundry has been quoted $15.10, delivered. Iron on contracts is moving freely. The large buyers in this territory are practically out of the market, although the leading harvester interest is buying moderate tonnages of off-grade iron.

The following prices represent the market for Chicago delivery, except Northern foundry and malleable Bessemer, which are quoted f. o. b. local furnaces:

(First Half Shipment.)

Lake Superior charcoal	$16.50
Northern foundry No. 2	14.00
Southern foundry No. 2	14.85
Southern silveries, 5 per cent silicon	15.60
Jackson Co. silveries, 8 per cent	17.40
Malleable Bessemer	14.00
Alabama basic	14.85

Billets.—The demand is improving and prices are somewhat firmer. Sales of small quantities for quick shipment to forge shops are quite active. We quote, for Chicago delivery, as follows: Open-hearth forging billets, $26.50, and re-rolling billets, $23.

Merchant Bars.—Prices of steel bars are a little firmer as a result of well-sustained specifications. Local mills are making sales at quotations ranging from 1.28c to 1.33c, Chicago, depending on the tonnage and character of the order. On very desirable orders for steel bars some makers, however, are still quoting 1.25c, Chicago. Shipments out of stock are improving.

We quote, f. o. b. Chicago, as follows:

Bar iron, 1.15c to 1.20c; hard steel bars, rerolled, 1.15c to 1.20c; soft steel bars, bands and small shapes, 1.25c to 1.33c, base; hoops, 1.48c; smooth finished machinery steel,

inch and larger, 1.78c; shafting 60 per cent off list for carload lots, 55 per cent off for less than carloads.

On iron and steel from local stock, we quote as follows:

Bar iron, 1.50c to 1.60c per pound base; soft steel bars, 1.50c to 1.60c per pound base; soft steel hoops, 1.80c to 1.90c, full extras.

Structural Material.—The past week witnessed a sharp curtailment in fabricating orders, but, at the same time, on account of the heavy demand for shapes from local mills due to business already in hand, prices are stiffening perceptibly. The Hydraulic Engineering Co., Keokuk, Ia., has let a contract for the lock gates at the new Keokuk dam, which will require 591 tons of structural material. The George A. Fuller Construction Co., Chicago, has taken a general contract for a scaffold, 107 tons, to be erected at Kansas City, Mo. The Modern Steel Structural Co. will fabricate a factory, 147 tons, for Charles Stein, Hammond, Ind. Local mills are well filled with business, delivery being offered in from three to six weeks. The minimum price in the Chicago market is now apparently 1.30c, and certain eastern mills represented in this district have raised their quotations to 1.20c, Pittsburgh.

We quote, mill prices, f. o. b. Chicago, as follows:

Beams and channels, 15 inches and under, 1.30c to 1.35c. For extras, see Pittsburgh report.

Plain material out of store is as follows:

All angles, 3 inches and larger, including 6 inches, $1.60 to $1.65 per 100 pounds; angles over 6 inches, $1.70 to $1.75 per 100 pounds, base; beams, 3 to 15 inches, inclusive, $1.60 per 100 pounds, base; channels, 3 inches and larger, $1.60 per 100 pounds, base.

Rails and Track Fastenings.—The local rail mills are now operating on fairly good schedules. The Illinois Steel Co. recently booked 11,500 tons of open-hearth rails from the Missouri Pacific and is understood to have taken 20,000 tons from the Wabash railroad. Orders for track fastenings are keeping pace with the rail business. The Santa Fe, St. Paul and Rock Island are still figuring on their requirements.

We quote, light rails, f. o. b. Chicago, and track fastenings, f. o. b. Joliet, as follows:

Light rails, carloads, 40 to 45-pound, 1.16c to 1.20½c; 30 to 35-pound, 1.19½c to 1.24c; 16, 20 and 25-pound, 1.20½c to 1.25c; 12-pound, 1.25c to 1.29½c.

Light section relayers, 45 pounds and under, subject to inspection, $21 to $23; standard section relaying rails, subject to inspection, $23.50 to $24.

Track fastenings, f. o. b. Joliet, angle bars, 1.50c; railroad spikes, 1.50c to 1.55c, smaller size spikes, 1.65c, base; track bolts with square nuts, 1.90c base.

Plates.—The local mills continue to find it difficult to satisfy delivery requirements in many cases, although all the plants in this territory are operating at capacity. The Inland Steel Co. has announced its intention of becoming an aggressive factor in the western plate market and will build a new 90-inch shear plate mill this year. The price situation shows some improvement, the minimum quotation now being 1.30c, Chicago, and it is doubtful if any concessions under this figure can be obtained at the present time.

We quote, mill prices, f. o. b. Chicago, as follows:

Tank plates, ¼ inch thick, 6¼ to 100 inches wide, 1.30c to 1.35c. For extras, see Pittsburgh report.

Store prices are as follows:

Tank steel, ¼ inch and heavier, up to 72 inches wide, 1.60c.

Sheets.—On account of the high price of spelter, together with other unfavorable influences, the local makers are now asking 3.08c, f. o. b. mill for No. 28 galvanized sheets and have withdrawn all lower quotations. Some eastern mills represented in this market are still taking business on a basis of 2.85c, Pittsburgh. There is practically no profit to the makers in galvanized sheets under prevailing conditions and a strong effort will be made to advance quotations.

We quote, store prices, f. o. b. Chicago, as follows:

Blue annealed, No. 10, 1.90c; No. 12, 1.95c. Box annealed, No. 28, 2.30c. Galvanized, No. 28, 3.35c.

For mill prices, see Pittsburgh report. Freight to Chicago, 18 cents.

Wire Products.—The weather remains unfavorable, there being additional heavy snow over the west on Monday of this week. These conditions are interfering rather seriously with the movement of wire products and business in these lines is at an ebb. The advance of spring is expected to materially relieve this situation.

We quote, f. o. b. Chicago, as follows:

Wire nails, jobbers' carload lots, $1.78; retailers' carload lots, $1.88; retailers' less than carload lots, $1.98; painted barb wire, jobbers' carload lots, $1.78; retailers' carload lots, $1.88; retailers' less than carload lots, $1.98, with 30c for galvanizing; plain wire, jobbers' carload lots, $1.58; retailers' carload lots, $1.63.

Merchant Pipe and Tubes.—Considering the character of the season, the demand for merchant pipe is good and new business in small lots is coming out quite actively. Prices are well maintained. Some improvement is noted in specifications for boiler tubes, on which prices are fairly steady.

We quote, store prices on merchant pipe and tubes, f. o. b. Chicago, as follows:

Iron and Steel Pipe Basing Prices

	Steel.		Iron.	
	Black.	Galv.	Black.	Galv.
Butt.				
⅛ inch and ¼ inch.	71.2	50.2	63.2	42.2
⅜ inch	75.2	64.2	66.2	55.2
½ inch to 1½ inch.	78.2	69.2	71.2	62.2
Lap.				
2 inch	76.2	68.2	68.2	60.2
4½ inch to 6 inch..	77.2	68.2	69.2	60.2
Card Weight.				
7 inch to 12 inch...	74.2	63.2	67.2	56.2
Extra Strong Plain Ends.				
Butt.				
⅛, ¼, ⅜ inch.....	66.2	54.2	60.2	48.2
½ inch	71.2	59.2	65.2	53.2
⅝ inch to 3 inch...	76.2	64.2	....	....
Lap.				
2 inch	72.2	60.2	66.2	54.2
7 inch to 8 inch....	66.2	54.2	60.2	48.2
Double Extra Strong.				
Butt.				
½ inch	59.2	47.2	....	....
¾ inch to 1½ inch.	62.2	50.2	....	....
Lap.				
2 inch	60.2	48.2	....	....
4½ inch to 6 inch..	61.2	49.2	....	....
7 inch to 8 inch....	54.2	42.2	....	....

Tubes

	Lap weld steel.	Charcoal iron.	Shelby seamless.
	Per cent.	Per cent.	Per cent.
1 inch	39	..	57½
1¼ to 2¼ inch.....	55	40	35
2¾ to 3¼ inch.....	65	50	46
3½ to 4½ inch.....	67½	50	46
5 to 6 inch.....	55	..	..

Cast Iron Pipe.—A period of quiet has settled over the cast iron pipe trade in the west. The United States Cast Iron Pipe & Foundry Co. has been awarded 2,228 tons of water pipe at Kansas City, Mo., and has formally booked 1,300 tons at Toledo, O. Prices are firm but not quotably higher.

We quote as follows:

Four-inch water pipe, $26.50; 6 to 12 inches, $24.50, larger sizes, $24; gas pipe, $1 a ton higher.

Old Material.—The market is perceptibly stronger, prices having advanced generally between 25 and 50 cents a ton. This condition seems to have been brought about by the attitude of various steel makers in this district and also by increased rollings of bar iron. Deliveries are somewhat better but continue below normal. The St. Louis & San Francisco railroad sold 670 tons of various classes of scrap last week, including 100 tons of short steel rails. The Illinois Central is offering 2,300 tons.

We quote, for delivery in consumers' yards, Chicago, as follows:

Gross Tons

Old car wheels	$13.00 to 13.50
Old iron rails	14.50 to 15.00
Rerolling rails (45 ft. and over)	12.50 to 13.00
Old steel rails (3 ft. and under)	11.75 to 12.25
Frogs, switches and guards....	10.75 to 11.25

Heavy melting steel	11.00 to 11.50
Shoveling steel	10.25 to 10.75

Net Tons

No. 1 R. R. wrought	$11.00 to 11.50
No. 2 R. R. wrought	10.00 to 10.50
Arch bars and transoms	13.50 to 14.00
Knuckles, couplers and springs	10.00 to 10.50
Shafting	13.50 to 14.00
Iron car axles	18.25 to 18.75
Steel car axles	15.50 to 16.00
Locomotive tires	13.50 to 14.00
Dealers' forge	8.75 to 9.25
Pipe and flues	8.25 to 8.75
No. 1 cast	10.75 to 11.25
No. 1 busheling	8.75 to 9.25
No. 2 busheling	6.25 to 6.75
No. 1 boiler cut	7.00 to 7.50
Boiler punchings	12.50 to 13.00
Cast and mixed borings	6.00 to 6.50
Machine shop turnings	6.50 to 7.00
Railroad malleable	10.25 to 10.75
Agricultural malleable	9.25 to 9.75
Angle bars, splices, etc., iron	12.75 to 13.25
Angle bars, steel	10.00 to 10.50
Stove plate and light cast scrap	9.25 to 9.75

CINCINNATI

Better Tone to Pig Iron Market---Coke Higher

Office of THE IRON TRADE REVIEW,
503 Mercantile Library Bldg., March 12.

Pig Iron.--While practically at a standstill, the pig iron market here presents a more favorable tendency than it did last week, and it will probably not be long now before certain developments, such as buying for the last six months of the year, should force prices to take either an upward or a downward trend. Indications point to better conditions. Nothing has occurred recently that could be used as a basis upon which the market could be tested, as both sales and inquiries have been small and few, and there is still a prevailing inclination among local dealers to refuse to quote into the second half, owing to the unsettled outlook. Buyers are also uneasy, and prefer to buy in small lots for prompt delivery whenever iron is needed. The favorable side of the whole situation is the fact that in most cases, at least, stocks in yards are being steadily reduced, shipments are going forward, mostly on contract, as well as can be expected, and sales are being made at the recently advanced price of $10.50, Birmingham, for No. 2 southern foundry iron. There is, though, still some iron left in the south that is being quoted at a flat rate of $10, Birmingham, for the same grade, and also a small lot of Birmingham resale iron is being offered at the same price with no apparent effect upon the market, as Alabama irons generally command $10.50. Recent inquiries include 1,000 tons of northern iron for second half delivery from a central Indiana melter, and 500 tons of No. 3 southern, from a Kentucky user. The railroad situation, instead of improving, is probably worse, and deliveries in some cases cannot possibly be made on scheduled time, even on iron contracted for at the beginning of the year. Many users are, therefore, at times handicapped for lack of supplies, as it has been their tendency lately not to carry large stocks, and the efforts of dealers right now seem to be confined to supplying spot demands and getting this iron, as well as that already contracted for, delivered. The northern situation has not changed any, and sales and quotations on northern foundry No. 2 are being made at $13, Ironton. There is a better demand here at present for ferro-manganese, probably due to the decrease of imports from England, caused by the strike in that country. We quote Cincinnati prices as follows, with freight rates from Birmingham, $3.25, and from Ironton, $1.20:

Southern foundry No. 2	$13.25 to 13.75
Southern foundry No. 3	12.75 to 13.25
Southern foundry No. 4	12.50 to 12.75
Southern gray forge	12.50 to 12.75
Mottled	12.25 to 12.50
Southern No. 1 soft	13.75 to 14.25
Southern No. 2 soft	13.25 to 13.75
Standard southern car wheel	25.25 to 25.50
Northern No. 2 foundry	14.20
Northern No. 3 foundry	13.70
Northern No. 4 foundry	13.45 to 13.70
Jackson co. 8 per cent silicon	16.45 to 16.95

Coke.--The prices on coke have been generally advanced during the week, and the indications are that they will go higher before the next report. Demands are heavier owing to the fact that rumors of a coming strike in the coal fields have caused users to want to store up as large amounts as possible. They cannot be supplied, though, as the shortage of labor and output in the coke fields, and the increasing inability of the railroads to handle even enough so that dealers can supply prompt demands, have caused contracts being made to drop to a minimum. Dealers report that there are no box cars left in which coke can be shipped from the Connellsville district, and as a result, they are being forced to use rack cars, which are not satisfactory. Melters are generally suffering as a result of the continued slow shipments by railroads on supplies contracted for some time ago. Connellsville foundry coke is quoted here all the way from $2.35 to $3. We quote below from the leading coke producing districts as follows:

	Prompt shipment.	Contract second half.
Connellsville district:		
Foundry coke	$2.40 to 3.00	$2.35 to 3.00
Furnace coke	1.90 to 2.00	1.85 to 2.00
Wise county district:		
Foundry coke	$2.10 to 2.25	$2.10 to 2.25
Furnace coke	1.85 to 2.00	*Sliding [scale basis.
Pocahontas district:		
Foundry coke	$2.00 to 2.25	$2.00 to 2.25
Furnace coke	1.65 to 1.75	1.70 to 1.90
New river:		
Foundry coke	$2.50 to 3.15	$2.60 to 3.25
Furnace coke	2.00 to 2.10	2.10 to 2.20

*Sliding scale basis means $1.60 for coke based on $9, Birmingham, for pig iron, with an advance of 16⅔ per cent ot the amount over $9 which pig iron is quoted. This is the usual basis. Other forms of sliding contracts are also made.

Finished Material.—The local sheet mill is still quoting an advance of from $1 to $2 a ton on all sheets, especially attributing the rise on galvanized sheets to the present high price of spelter, and reports sales being made at these figures. Steel bars and structurals are stronger. One local firm reports that it has received word to accept no business on bars below 1.15c, and nothing on structurals below 1.20c. The Louisville & Nashville railroad has an inquiry in the market here for concrete reinforcing bars for use in building 200 miles of new road, and it is estimated that about 2,000 tons will be required. For mill prices, see Pittsburgh report.

Warehouse business is fair, and some fairly good lots were sold during the past week, but business is somewhat handicapped by unfavorable weather conditions. There seems to be no special demand for any certain line of supplies, and sales are being made in about equal quantities all along the line. A good building year is predicted, however, and business will undoubtedly improve as soon as contractors can begin work. Warehouse prices, f. o. b. Cincinnati, are as follows:

Steel bars, 1.60c base; iron bars, 1.55c to 1.60c base; structurals, 1.70c base; plates, ¼ inch and over, 1.70c base; sheets, blue annealed, No. 10, 1.90c base; rivets, cone head, 2.25 base; cold rolled shafting, 60 per cent discount; boiler tubes as follows : 1¾ to 2¼ inch, 61 per cent discount; 2½ inch, 63 per

cent discount; 2¾ to 3¼ inch, 66 per cent discount; 3½ to 4½ inch, 68 per cent discount; and 5 to 6-inch, 61 per cent discount; and soft steel cold twisted concrete bars, cut to length as follows: ¾ inch square and larger, 1.70c; ⅝ inch square and larger, 1.80c; ½ inch square and larger, 1.90c; ⅞ to ⅜ inch square and larger, 2.10c; ¼ inch square and larger, 2.20c to 2.30c.

Old Material.—There is a fair demand for relaying rails, for which prices vary somewhat, based mostly upon the conditions of the sale. Outside of this the market is at a standstill, with but little or no movement being reported along all lines. Dealers generally report that they are not doing much business, and there have been no transactions of any size during the past week. Small sales of cast scrap are reported at about $10.50, and a recent sale of cast borings for storage was made to a local dealer at about $4.25. According to the summation of reports we quote Cincinnati prices as follows:

Gross Tons

Old iron rails	$12.00 to 13.00
Old steel rerolling	10.50 to 11.50
Old iron axles	18.00 to 18.50
Steel melting scrap	9.25 to 10.50
Car wheels	10.50 to 11.00

Net Tons

Old No. 1 R. R. wrought	$10.50 to 11.50
No. 1 machinery	10.00 to 10.50
No. 1 busheling	8.00 to 9.00
Stove plate	6.25 to 7.00
Machine shop turnings	5.50 to 6.00
Cast borings	4.25 to 5.00
Grate bars	6.00 to 7.00
Sheet iron, bundled	6.50 to 7.50
No. 1 cast scrap	10.00 to 10.50
Heavy turnings	6.00 to 7.00

NEW YORK

Active Inquiry for Pig---Finished Lines Improving

Office of THE IRON TRADE REVIEW,
1115 West Street Bldg

Iron Ore.—Several additional cargoes of Venezuelan ore are now en route to this country and will be sold upon their arrival at eastern ports. This ore, running at 65 per cent and upwards in metallic iron, is being offered at 8 cents per unit f. o. b. Philadelphia. Some small additional sales of New Jersey ores were made this week to eastern furnaces on the basis of about 7¼ cents per unit, delivered. Port Henry operators are still delaying the adoption of formal price schedules.

Pig Iron.—Quite the most impressive inquiry for iron that has been current for several months in tonnage and in distribution is now pending in metropolitan, New England and up-state territory. Probably 30,000 tons of foundry, basic, malleable and low phosphorus grades is now current. Sales, however, are coming slowly, as buyers are moving with deliberation in closing. The tonnage of orders booked is altogether out of line with that inquired for, but the coming week will probably see a round volume of sales. Railway equipment companies are active in the market. A coupler concern is inquiring for 5,000 to 10,000 tons of basic for shipment to its up-state plant. The New York Air Brake Co. inquired for 6,000 tons of Nos. 1, 2, 3 and 4 foundry grades, the latter practically malleable, for Watertown, N. Y., the delivery period being subject to negotiations. The company has closed for a part of this tonnage with a western New York furnace. The General Electric Co. is out for 2,800 tons of high silicon foundry for Lynn, Mass., and for 2,275 tons of low phosphorus for Everett, Mass., for last half. This is in addition to about 700 tons of special analysis foundry for Schenectady put out a week ago. The International Steam Pump Co. has added 1,500 tons of foundry grades for early shipment to Harrison, N. J., making 2,000 tons asked for this plant and a total pending inquiry for this consumer of 3,000 to 4,000 tons. Two new inquiries of 1,000 tons of No. 2X each for New Jersey consumers came out this week, as well as about 1,000 tons additional for Connecticut. A Bridgeport, Conn., buyer has bought from Buffalo furnaces against an inquiry for 1,500 tons of foundry and 500 tons of malleable for March-April shipment and has also closed for some Virginia iron. A Jersey foundry continues in the market for 500 to 1,000 tons of No. 2X, and there are other scattered inquiries. Low prices are still appearing at different points. A Connecticut buyer is reported to have closed for 1,000 tons of No. 2X for second quarter at $15.00, delivered, which is the lowest New England price recently quoted. Other New England buyers report having been quoted on a similar basis. Usually New England sales are being made within the range of $15.35 to $15.75, delivered, for No. 2X. Lehigh and Schuylkill Valley foundry prices continue from $14 to $14.50, furnace, for No. 2X. Some fair sales of Virginia iron to New England for mixtures are noted. A Harrisburg, Pa., steel maker is reported to have closed for an additional block of basic with an eastern Pennsylvania maker. We quote for prompt and second quarter delivery at tidewater, southern and Virginia iron being given at New York docks, as follows:

Northern foundry No. 1	$15.20 to 15.45
No. 2 foundry	14.70 to 15.20
No. 2 plain	14.50 to 14.70
No. 2 Virginia	15.05 to 15.30
No. 2 southern foundry	14.50 to 14.75
Malleable	15.25 to 15.50
Gray forge	14.00 to 14.25

Ferro-Alloys.—Consumers of ferro-manganese, probably apprehensive over possible shortages because of the English coal strike, have been buying quite freely the past week for delivery over the remainder of the year. Upwards of 5,000 tons have been purchased, universally at $41, seaboard. All English makers following this movement withdrew from the market and temporarily are making no quotations until the strike situation is clarified. An early advance in the market is generally expected. Other alloys show no particular activity. We quote 80 per cent standard ferro-manganese at $41, seaboard, and 50 per cent ferro-silicon at from $68 to $72.

Cast Iron Pipe.—A liberal volume of new business continues to appear which is of a volume unsurpassed in the past four or five years, according to prominent makers. Private lettings continue especially good. Some eastern shops now find themselves very comfortably booked for several months ahead, but prices improve slowly. Rochester, N. Y., is taking bids this week on 3,000 tons of 6 to 42-inch. The Beaver Engineering & Construction Co. was awarded the contractor's letting of 6,650 tons for Manhattan, placed in the week. We quote 6-inch pipe at from $22 to $23 f. o. b. New York in carload lots.

Finished Material.—As more favorable weather conditions approach, there is a manifestly better feeling to the market and more hopeful declarations are being made. The freer movement of materials is causing some increase in demand, but the improvement is largely in sentiment. Prices for finished products still lack firmness and fluctuate in accordance with the attractiveness of the order. Plates and shapes are quotable at 1.10c to 1.15c, Pittsburgh, for delivery in this market, but steel bars are

firmer at 1.10c, Pittsburgh. Bar iron still shows weakness.

The week's structural awards are only a fair volume and railroad tonnages figure lightly. The Norfolk & Western has given the Virginia Bridge & Iron Works 300 tons; the New Haven to L. F. Shoemaker & Co. 350 tons; and the Boston & Maine, several small bridges to the Phoenix Bridge Works and the Boston Bridge Works. The Pennsylvania railroad has awarded a bridge over the Susquehanna river at Lewisburg, Pa., 1,500 tons, to the Pennsylvania Steel Co.

Among other awards of the week are 1,800 tons to Milliken Bros., Inc., for the Reliance Construction Co.'s loft, Fourth avenue and Thirtieth street; 1,000 tons for the Springs loft, West Thirty-eighth street, and 750 tons for the Polo Construction Co.'s loft, West Thirtieth street, both to the Radley Steel Construction Co.; 400 tons to the Hay Foundry & Iron Works for a bakery for the Shultz Bread Co., Jamaica, N. Y. The A. E. Stevens Co., New York, has the general contract for the Albany High School, 1,000 tons. Bids are being taken on 1,000 tons for a machine shop for the Cramp ship yard, Philadelphia, and on 400 to 500 tons for a boiler house for the Metropolitan Museum of Art, this city. No decision has been reached on the 4,000 to 5,000 tons for the extensions to the J. I. Case Threshing Machine Co., Racine, Wis., for which Westinghouse, Church, Kerr & Co., New York, are the engineers.

The Western Maryland railroad has put off for another week final action on its inquiry for 2,750 cars, but it is expected to close very shortly. The Wabash inquiry for 2,750 cars is also open. The Pressed Steel Car Co. has taken 50 tank cars for the Northern Pacific railroad. No new inquiries of importance have appeared. We quote, delivered at New York tidewater, as follows:

Plain structural shapes 1.26c to 1.31c; tank plates, 1.26c to 1.31c; steel bars, 1.26c; common iron bars, 1.25c to 1.30c; plates and shapes from store, 1.70c to 1.30c; plates and shown under Pittsburgh report.

Coke.—Buying of coke, particularly foundry grade, continues lively, as buyers are seeking to protect themselves against the effects of a possible suspension in the coal regions. Inquiries are coming to sellers from all quarters, but selling propositions are being made carefully, as some operations are going completely out of the market. In New England, one seller has disposed of about 25,000 tons foundry coke on contract during the past few days on a minimum basis of $2.40, Latrobe ovens. One Latrobe maker has quoted $2.80, ovens. The market in general ranges from $2.40 to $2.65, ovens.

Rails and Track Materials.—Representatives of the steel rail manufacturers and the railroads will hold another meeting in New York, Thursday, March 21, for further consideration of the question of improvement of rail quality. This meeting will follow the more general meeting of railroad executives and rail makers, held several weeks ago. The Wabash railroad has closed upon its recent rail inquiry, placing 20,000 tons with the Illinois Steel Co. The Chesapeake & Ohio railroad has also finally placed its rail requirements, closing for 15,000 to 20,000 tons, of which 5,000 tons went to the Maryland Steel Co. and the balance to the Carnegie Steel Co. The Interborough Rapid Transit Co. is inquiring for 4,000 tons. The Rock Island railroad is about to place an order for 15,000 tons.

Old Material.—Heavier buying in the Pittsburgh district has strengthened sentiment in this market and holders of scrap are selling very slowly in the hope of higher prices soon. There is little improvement, however, in the breadth of the market, as eastern consumers will not pay higher levels. A tonnage of steel offered to one eastern mill at $12, delivered, was refused. The recent buying has encouraged speculation and some dealers are offering $12.75 for steel, delivered at Sharon, or other Pittsburgh district points. Jersey City and Newark cast prices range from $12.25 to $12.75, delivered, for heavy and machinery cast. We quote, gross tons, prices dealers will pay at New York tidewater, as follows:

Old car wheels	$10.50 to 10.75
Old iron axles	16.00 to 16.50
Old steel shafting	13.75 to 14.25
No. 1 heavy melt'g steel	9.50 to 9.75
No. 1 R. R. wrought	11.75 to 12.00
Wrought pipe	9.25 to 9.50
Cast borings	6.00 to 6.50
Mach. shop turnings	6.75 to 7.25
Heavy cast	10.75 to 11.00
No. 1 machinery cast	11.25 to 11.75
R. R. malleable	9.25 to 9.75
Stove plate	8.50 to 8.75
Grate bars	6.50 to 6.75

Freight rates on scrap per ton to Steelton, Pa., Columbia, Pa., Pottsville, Pa., and Harrisburg, Pa., are $1.50 from Jersey City and $2.00 from New York; to Coatesville, Pa., Ivy Rock, Pa., Phoenixville, Pa., and Reading, Pa., $1.50 from Jersey City and $1.80 from New York; to Bethlehem, Pa., $1.10 from Jersey City and $1.60 from New York; to Roebling, N. J., $1.00 from Jersey City and $1.50 from New York; to Milton, Pa., $1.60 from Jersey City, and $2.00 from New York.

ST. LOUIS

Pig Iron Demand At Minimum---Coke Deliveries Slow

Office of THE IRON TRADE REVIEW, St. Louis, March 12.

Pig Iron.—With the exception of an inquiry for 1,000 tons of southern No. 3, and one for 500 tons of northern No. 2, which appeared in the mails this morning, the demand for pig iron has dropped to the minimum, with very little indication of improvement in the near future. A sale of 500 tons of Lake Superior charcoal carwheel iron was made the latter part of last week. Prices of southern No. 2 are reported at $10.50, Birmingham, although some sales agents are quoting $10. Northern iron remains at $13 to $13.50, Ironton.

Our tabulated prices on southern iron, delivered, to which the Birmingham freight of $3.75 has been added, follow:

Southern No. 1	$14.50 to 14.75
Southern No. 2	14.00 to 14.25
Southern No. 3	13.50 to 13.75
Southern No. 4	13.00 to 13.50

Coke.—Prices of coke have again advanced, owing principally to the threatened coal strike, and the demand has somewhat improved. A shortage of cars continues to exist, and deliveries are difficult. Our revised quotations follow:

We quote 72-hour Connellsville foundry grades, $2.45 to $2.65 for first half of 1912; 72-hour foundry, $2.25 to $2.50 on tracks and for immediate delivery; 48-hour Connellsville furnace, $1.85 to $2.00; best 72-hour Virginia foundry, $2.25 to $2.50; 48-hour Virginia furnace, $1.85 to $2.00. The freight to East St. Louis and St. Louis is $2.80, and $2.70 from the Virginia fields when shipment is destined beyond St. Louis.

Finished Material.—The contract for steel to be used in the erection of a powerhouse for the Hydraulic Engineering Co. of Maine, was let last week to the McClintic-Marshall Construction Co., Pittsburgh. About 1,300 tons will be required. With this exception, business has narrowed down to requests for small lots. As many as three hotels, all of steel frame construction, are talked of in St. Louis, but have not progressed beyond the stage of rumor.

Old Material.—Scrap iron prices remain as follows, with very little business moving:

Gross Tons

Old car wheels	$13.00 to 13.50
Old iron rails	14.00 to 14.50
Re-rolling rails (5 feet and over)	12.00 to 12.50
Old steel rails (3 feet and under)	10.75 to 11.25
Light section relayers (45 lb. and under) subject to inspec..	20.00 to 21.00
Re-laying rails, subject to inspec.	23.50 to 24.00
Frogs, switches and guards	10.00 to 10.50
Heavy melting steel	10.50 to 11.00
Shoveling steel	10.00 to 10.50

Net Tons

No. 1 railroad wrought	$10.50 to 11.00
No. 2 railroad wrought	9.50 to 10.00
Arch bars and transoms	13.00 to 13.50
Knuckles, couplers and springs.	9.00 to 9.50
Shafting	13.00 to 13.50
Iron car axles	17.00 to 17.50
Steel car axles	15.00 to 15.50
Locomotive tires	14.00 to 14.50
No. 1 country wrought	8.75 to 9.00
Pipe and flues	7.50 to 8.00
Tank iron and cut boilers	7.00 to 7.25
No. 1 cut busheling	8.50 to 8.75
No. 2 cut busheling	6.00 to 6.25
Cast and mixed borings	5.25 to 5.50
Machine shop turnings	6.25 to 6.50
Railroad malleable	9.50 to 10.00
Agricultural, malleable	8.50 to 9.00
Stove plates	8.75 to 9.25
Angle splice bars (iron)	10.50 to 11.00
Angle splice bars (steel)	9.25 to 9.50

CLEVELAND

Greater Receipts for Vessels---Large Saving for Shippers

Office of THE IRON TRADE REVIEW, Penton Bldg., March 12.

Iron Ore.—Ore handling charges on Lake Erie docks will be cut practically in two before the opening of navigation this spring. The charge to the vessel unloading ore up to two years ago was 20 cents a ton. It was reduced to 15 cents in 1910 and has remained at that figure since. Owing to the wonderful improvement in ore handling machinery during the past few years, the 15 cent charge is known to be excessive and ample profit will result from a charge of 7 or 8 cents. The freight rate last year from the head of the lakes was 60 cents, and deducting 15 cents for unloading, the vessel received 45 cents, net. Freight rates for 1912 have not been fixed, but they will undoubtedly fall in sympathy with the unloading charge. If the unloading charge is cut to 8 cents, and the freight rate to 55 cents, the net gain to the vessel will be 2 cents per ton. On the basis of a movement of 40,000,000 tons, this would mean additional receipts of $800,000 for the vessels and a saving of $2,000,000 to shippers.

On base ores with the guarantee of 55 per cent on old range and Mesabi Bessemer, and 51½ per cent on old range and Mesabi non-Bessemer, we quote as follows: Old range Bessemer, $4.50; Mesabi Bessemer, $4.25; old range non-Bessemer, $3.70; Mesabi non-Bessemer, $3.50.

Pig Iron.—The heavy sales of steel-making iron during the past week have resulted in a much stronger feeling in the market. It is believed that there will be still more important buying at an early date. The only definite inquiry pending, however, is for 3,000 tons of basic for the United Steel Co., centers for April delivery. The foundry iron market is showing a tendency to advance, but Cleveland quotations are unchanged. We quote, for delivery in Cleveland for first half, as follows:

No. 1 foundry	$13.75
No. 2 foundry	13.25
No. 2 southern	14.35
Gray forge	12.50
Bessemer	15.15
Lake Superior charcoal	16.50
Jackson co. 8 per cent silvery	17.05

Coke.—Consumers of foundry coke are doing their utmost to accumulate coke so that they will have supplies on hand in the event of a strike of coal miners being declared. Sales agents are having great trouble to satisfy the demands of their customers as to deliveries, and prices are tending upward. We quote:

Connellsville furnace coke, $1.90 to $2.25 for prompt delivery, and $1.85 to $2.00 on contract; Connellsville foundry coke, $2.60 to $2.65 for prompt, and $2.40 on contract.

Finished Material.—The tone of the market shows decided improvement and both specifications and new business are coming in more satisfactory volume. The general contract for the State Normal School at Kent, O., has been awarded to R. H. Evans, Zanesville, and the steel, 400 to 500 tons, to T. H. Brooks & Co., Cleveland. On ordinary soft steel bars, 1.10c is now the minimum, and on special analysis steel for forging and other purposes, considerably higher prices are being paid. The general tendency among all sellers is toward asking higher prices. On plates, several companies have advanced their quotations to 1.20c. Many contracts expire April 1, and customers are being notified that all unspecified tonnage at the end of this month will be cancelled. Contracts for second and third quarter are being made in a very conservative way.

Old Material.—Some heavy melting steel is being shipped out of this city to Pittsburgh, which is paying a higher price than local consumers are as yet willing to offer. For this shipment steel $11.50 Cleveland, is being paid, while Sharon, Pa., consumers are offering an even higher price. Several railroad lists have closed this week, among them the Lake Shore on Monday and the Baltimore & Ohio on Wednesday, but the quantity of material taken was not large. The L. & W. list will close on March 20. The rolling mills in this city apparently are not interested in the market. We quote f. o. b. Cleveland, as follows:

Gross Tons

Old iron rails	$14.00 to 14.50
Old steel rails (under 6 ft.)	11.25 to 11.75
Old steel rails (over 6 ft.)	11.50 to 12.00
Relaying rails	19.50 to 20.00
Old car wheels	11.50 to 12.00
Old steel boiler plate	9.50 to 10.00
Malleable iron (railroad)	11.00 to 11.50
Steel axles	17.00 to 17.50
Axle turnings	8.50 to 9.50
Malleable iron (agricultural)	10.00 to 10.50
Heavy steel	11.25 to 11.75
Country mixed steel	9.00 to 9.50
Bundled sheet scrap	7.50 to 8.00

Net Tons

No. 1 R. R. wrought	$11.00 to 11.50
No. 1 busheling	9.00 to 9.50
No. 1 machine cast	11.00 to 11.50
No. 1 dealers' wrought	9.50 to 10.00
Machine shop turnings	7.00 to 7.25
Pipes and flues	8.00 to 8.50
Wrought drillings	7.00 to 7.25
Stove plate	9.00 to 9.50
Cast borings	6.50 to 7.00
Wrought iron piling plate	15.50 to 16.00
Wrought iron arch bars	14.50 to 15.00

J. E. Donlevie, who conducts a scrap metal business at Chester, Pa., has broken ground for a building and yard in that city. He will move his business to the new site as soon as it is ready, making the change because of the fact that it will offer convenient shipping facilities.

The Lycoming Foundry & Machine Co., Williamsport, Pa., which recently increased its capital stock from $100,000 to $150,000, advises that this action was due to an increased volume of business which necessitated the enlargement of its working capital.

BUFFALO

Pig Iron Sales Improve in Volume

Office of THE IRON TRADE REVIEW,
Buffalo, March 12.

Pig Iron.—During the week sales have improved as to tonnage, and inquiry has been heavier than for some time past. Probably 15,000 tons of foundry grades were inquired for the past week and upward of 10,000 tons of malleable and basic. Buyers seem to be taking a more active interest in purchases, although the furnaces are, as a rule, slow on quoting for extended shipment, with weather conditions, the probable coal strike, etc., prevailing. Furnaces continue to ship heavily, but even with this, some concerns are on the ragged edge for iron—due to the acute railroad congestion. This is especially true of consumers on the Canadian lines, where the service has been badly crippled, who are dependent for American iron in their mixtures.

The prices for the week, f. o. b. furnaces, range as follows:

No. 1X foundry	$14.00 to 14.50
No. 2X foundry	13.75 to 14.00
No. 2 plain	13.50 to 13.75
No. 3 foundry	13.25 to 13.50
Gray forge	13.00 to 13.25
Malleable	13.75 to 14.25
Basic	13.75 to 14.25
Charcoal	15.50 to 17.25

Finished Material.—Indications point to the beginning within a short time of a good buying movement. One interest reports that its specifications for the first ten days of March exceeded the same period in February, and that a stronger sentiment is apparent is the general impression. Many users of bars and bar products are in the market for nearby deliveries, while the dealers are being forced to extend shipment. Structural material and plates are being quoted 1.20c straight, Pittsburgh, while others are taking favorable business, as to tonnage and delivery, at 1.15c base. The week's market feature has been the increased demand for structural material and plates. The fabricators continue quite active. Bids on the C. B. Hill building, Buffalo, 150 to 200 tons, will be opened March 13, Bethune, Bethune & Fuchs, architects. Metz Bros. & Co., Buffalo, were awarded the general contract on the new auditorium and clinic, Cornell university, Ithaca, N. Y., 300 to 400 tons.

Old Material.—The market is reported stronger, but not sufficiently so to change prices of the past three weeks. This condition is due to better weather conditions permitting access to stocks on the yards and movement of shipments. The inquiries indicate a better tone. The cars have been sewed up to the extent of crippling business. Now the dealers do not seem to be so anxious to accept bids offered them by the consumers. The prices for the district per gross ton, f. o b. Buffalo, are substantially as follows:

Heavy melting steel	$12.00 to 12.75
No. 1 railroad wrought scrap	14.00 to 14.25
No. 1 R. R. and mch. cast scrap	13.50 to 14.00
Old steel axles	18.50 to 19.25
Iron axles	22.00 to 22.50
Car wheels	11.75 to 12.00
Railroad malleable, scrap	12.50 to 12.75
Wrought iron and soft steel turn.	7.25 to 7.50
Cast iron borings	6.50 to 6.75
Low phosphorus steel scrap	15.75 to 16.00
Old iron rail	15.00 to 15.50
Tank iron	10.00 to 10.25
Boiler plate, sheared	13.75 to 14.25
Pipe and tank	9.50 to 10.00
Stove plate	9.75 to 10.00
Sheet iron	7.00 to 7.50
Locomotive grate bars	11.00 to 11.25

BRITISH MARKET

Works Stoppage Does Not Affect Prices

Office of THE IRON TRADE REVIEW,
Prince's Chambers, Corporation St.,
Birmingham, Eng., March 2.

In spite of the most strenuous efforts to stave off the coal strike and a good deal of well-meant intervention by the government, the whole of the pits in Great Britain are closing down. With a few rare exceptions they ceased drawing on Thursday night, but a few pits are at work until today (Saturday). On Monday, the only pits still in operation will be a few at work solely to furnish coal for pumping operations. With very few exceptions, iron and steel works are unprovided even with a few days' supplies. It is notorious that, since the beginning of the year, fuel supplies have been short, and in a few cases, short working time even preceded the coal strike. In Sheffield, many thousands of men have already been discharged, and as indicated in an earlier letter, a general stoppage of blast furnaces is imminent. In the Middlesbrough district, a number of blast furnaces have already gone on slack blast. By the end of next week it is expected that all the furnaces will be either damped down, or blown out. It is remarkable that prices of pig iron have been scarcely affected. Yet the explanation is quite simple, the pig iron using establishments being unable to keep in operation. In the Scotch districts, a number of blast furnaces have been blown out this week, and arrangements for stopping business entirely are practically complete. The Cleveland market has been assisted, to some extent, by increased shipments, these having been the best for two years. The total, up to the present, is about 75,000 tons, and the amount in store is now 519,000 tons. Coke supplies in that district are very slack. Smelters are quite disinclined to accept any contracts, in the absence of assurances as to when business will be resumed. The selling price of Middlesbrough warrants is 49s 7d ($12.14), with 49s 10d ($12.20) for a month, and 50s 5d ($12.34) three months. On the Birmingham exchange there was a general withdrawal of quotations, very few smelters having any metal to offer. But the few who had, managed to realize a slight increase. The hematite department has practically sus-

pended sales, owing to the stoppage of the steel trade. But for such business as is done, the quotation for east coast mixed numbers is 66s ($16.16) for prompt delivery, and 67s 6d ($16.52) to the end of June. On the whole, the tone of the pig iron market is slightly better.

Finished Material.—The effect of the strike on the finished iron and steel works has been immediately felt, and in Sheffield alone there are 10,000 men idle. The great firm of William Jessop & Sons, Brightside, has already 1,500 men out of employment, and the other 700 men will be out in less than a fortnight. Brown, Bayley's Steel Works is already on short time. The Sheffield Forge & Rolling Mills, and the Sheffield Steel Rolling Mfg. Co. stopped at once with the pits. In Rotherham, 10,000 men will be idle before the end of next week, in the iron and steel trades. The great firm of Henry Bessemer & Co. cannot continue working beyond Tuesday, and all the rolling and forging branches of Sheffield, employing 5,000 men, will close down before the end of the week. The cutlery trade of Sheffield will, of course, be stopped for want of material. As a rule, the notices given have been of a tentative character, and have warned the men to be prepared for a stoppage at any time. At Sheffield, the railway companies commandeered, for railway purposes, several train loads of coal consigned to local merchants. Inquiries among the Black Country iron works show that arrangements have been made at all these establishments to cease work, simultaneously with the strike. Thousands of other works, of course, throughout the Kingdom, which derive their power directly from coal, will cease, at varying intervals, soon after the coal stoppage. If the strike should be settled at an early date, the prospects of the iron and steel trade would be quite satisfactory, as railway companies are increasing their orders for axles, tires and springs, and an abundance of orders are known merely to be waiting the settlement of the coal strike. It is known that very large orders have found their way to Belgium and Germany, owing to the British inability to undertake deliveries, and this outflow is likely enough to continue. Substantially prices are unchanged.

BIRMINGHAM

Southern Producers Stick to Higher Figures

Office of THE IRON TRADE REVIEW, Birmingham, Ala., March 12.

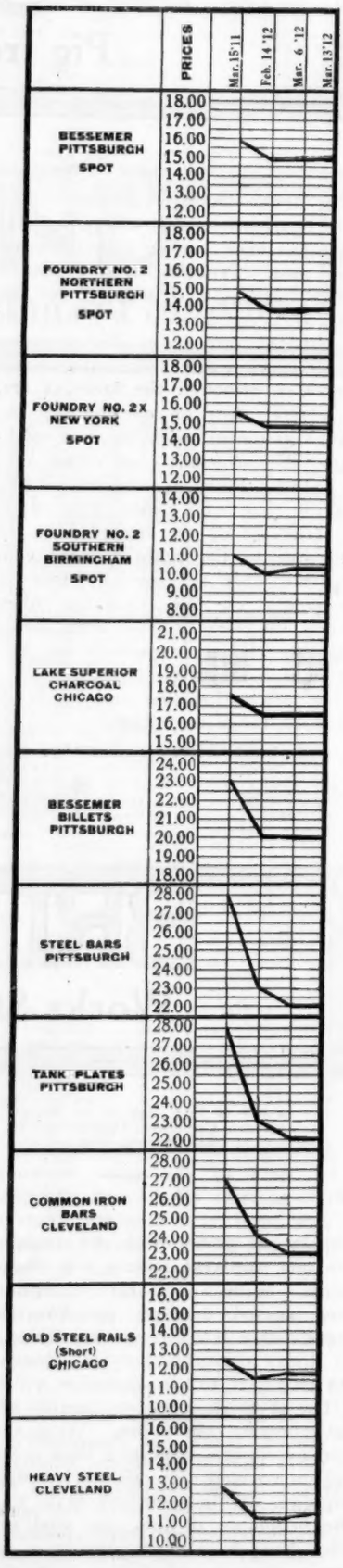
Pig Iron.—Producing interests continue to adhere to their own views as to price, and as a result of the indications favoring the maintenance of a $10.50 per ton Birmingham basis, the aggregate production will probably be larger by the output of two stacks. This increase refers to one furnace now being blown in, and to one furnace that was scheduled to go out in the event the $10, Birmingham, basis had have obtained. Specific information since last report, covers the sale of an aggregate of 2,000 tons, by one producer at $10.50 per ton for No. 2 foundry; an aggregate of 500 tons by another, at the same price, and one lot of 200 tons of special analysis iron, that brought $10.75 per ton at Birmingham. All of the tonnage mentioned is for comparatively early shipment, in addition to which, a very liberal volume of carload orders was placed for spot delivery. Particular attention is given the fact that shipments against contracts are being made at a more satisfactory rate, and that the smaller founders have recently consumed a larger tonnage. Stock returns for March 1, show a reduction of 27,000 tons, notwithstanding the length of the month and the delay to shipments. There were 19 active stacks in the Birmingham district on March 1, which will be increased to 20 within the present week. Inquiries represent larger tonnage than has been represented at any time since January 1. We quote all grades, as follows, per gross ton, f. o. b. cars at Birmingham district furnaces, viz.:

No. 1 foundry	$10.75 to 11.25
No. 2 foundry	10.25 to 10.75
No. 3 foundry	9.75 to 10.25
No. 4 foundry	9.25 to 9.75
Gray forge	9.50 to 9.75
Mottled	9.25 to 9.50
Standard basic	10.25 to 10.75
Off basic	10.00 to 10.50
Standard charcoal	22.50 to 23.00

These prices are per gross ton f. o. b. cars at Birmingham district furnaces.

Cast Iron Pipe.—The tonnage placed so far this month is in excess of that placed during the same period in February, and it is noted that no large requirements have recently been entered. An attractive demand for maintenance work is noted, and extensions, and indications are that the tonnage for such purposes will grad-

PRICE CHART



ually increase for some months. No change has been made in quotations. We quote water pipe as follows, per net ton, f. o. b. cars here: 4-inch to 6-inch, $23; 8-inch to 12-inch, $22; over 12 inches, average $21, with $1 per ton extra for gas pipe. These prices are probably shaded for large municipal contracts.

Old Material.—No further revision has been made in asking prices, but the business transacted in the past week was very light. The large mills are disposed to buy bargain lots only, while recent buying on the part of the smaller concerns has apparently taken care of such requirements to an appreciable extent. Dealers' prices are as follows, per gross ton, f. o. b. cars here, viz.:

Old iron axles, light	$12.00
Old steel axles, light	11.50
Old iron rails	12.50
No. 1 R. R. wrought	11.00
No. 2 R. R. wrought	9.50
No. 1 country	6.50
No. 2 country	6.00
No. 1 machinery	9.50
No. 1 steel	8.50
Tram car wheels	8.50
Standard car wheels	10.00
Light cast and stove plate	6.00

Coal and Coke. — Recent developments in foreign markets, together with conditions now existing as to labor conditions in the west and middle west, are not without effect on the local market, although the movement to gulf points, and to competitive markets has increased but little so far. Annual contracts to cover requirements at southern steam producing plants will no doubt be entered at higher figures than ruled in the year just ended. Straight run-of-mine coal from the best seams is now quotable at from $1.40 to $1.50 per net ton at mines, with screened and washed coal bringing a relatively higher price. The producers of foundry coke are well supplied with orders, and all local ovens for such production are being operated to capacity. We quote this last at from $3.25 to $3.75 per net ton at Birmingham district ovens.

PHILADELPHIA

Gradual Improvement in Demand and Prices

Office of THE IRON TRADE REVIEW,
Philadelphia, March 12.

Conditions in the eastern iron and steel market reflect a better tone and seem more promising. Heavier tonnage in finished bookings is reported by several eastern mills and prices are more firmly held. Melting materials show a more expectant sentiment following the reports of heavy purchases by the Steel Corporation and other large consumers in the middle west. The Steel Corporation is now buying scrap in the open market for this district, but has not yet fulfilled the expectation that it may buy basic pig iron for local consumption. The threatened labor suspension in the coal districts continues an interesting factor overhanging the market.

Pig Iron.—Sentiment among eastern sellers is stronger and the market seems more expectant, but this as yet has not developed any increase in the volume of trade. Purchases of pig iron by the United States Steel Corporation in the Pittsburgh district have stimulated the anticipation among eastern producers that a tonnage of basic may be bought for the Pencoyd works of the American Bridge Co. in this district, which regularly receives its iron from the Pittsburg territory. Round tonnages of stock iron have been offered to the leading interest by eastern furnaces, but as far as learned no purchases have been made, although heavy steel scrap is being bought for the Pencoyd plant in the local open market. The threatened suspension of operations in the anthracite coal regions continues to give the future of the market the uncertainty of possible higher costs and is causing makers to act with caution. The monthly meeting of the Eastern Pig Iron Association this week disclosed some decrease in both stocks and orders, but the showing was not unfavorable. The number of blowing stacks was unchanged, but the Bethlehem furnace that went in is a considerably heavier producer than the Brooke stack, which retired. Foundry iron selling is comparatively light. Prices are unchanged and still show considerable range, averaging around $15, Philadelphia, or slightly less for standard No. 2X. Some Virginia iron sales are reported at higher prices, but the level there generally remains $12.25, furnace, for No. 2X for prompt and second quarter.

We quote for prompt and second quarter shipment, delivered in Philadelphia and vicinity, as follows, handling and local shipping charges from docks being included for Virginia and southern iron:

No. 1X foundry	$15.25 to 15.50
No. 2X foundry	14.75 to 15.25
No. 2 plain	14.50 to 14.75
Standard gray forge	14.00 to 14.25
Basic	14.25
No. 2X Virginia	15.50 to 15.75
No. 2 southern	14.75 to 15.00
Standard low phosphorus	19.00 to 19.25

Finished Material.—A noticeably improved undertone has made itself apparent in the eastern market and is apparently spreading. Several eastern Pennsylvania mills have entered a substantially increased tonnage in plates, sheets and billets the past week, and are more encouraged. One plate maker booked the past week at more than 100 per cent capacity and is increasing production. One eastern shape mill has gotten its operations up to 85 to 90 per cent of capacity, but is now showing a tendency to run more slowly. One of the striking features of the market is the almost universal request for quick shipments.

Old Material.—Reports of buying of heavy melting steel by the United States Steel Corporation and by other large middle western consumers has quickened the expectations of dealers and the eastern scrap market is firmer. The Steel Corporation has been following the rather unusual method of late of buying heavy steel scrap through local dealers at fixed offers for delivery to its Pencoyd works. Though it regularly buys considerable scrap for this plant, it customarily deals direct with large industrial producers and does not enter the open market. The Pennsylvania and other eastern railroads disposed of their lists this week.

Old iron rails	$15.75 to 16.25
Old steel rails (rerolling)	13.00 to 13.50
No. 1 heavy melting steel	11.75 to 12.25
Old car wheels	12.00 to 12.50
Old iron axles	22.00 to 23.00
Old steel axles	16.75 to 17.00
No. 1 railroad wrought	14.25 to 14.75
Wrought pipe	11.75 to 12.25
Cast borings	8.50 to 9.00
Machine shop turnings	9.00 to 9.50
Heavy cast	12.50 to 13.00
Malleable	11.50 to 12.00
Stove plate	10.00 to 13.25

Freight rates per ton on scrap from Philadelphia to principal eastern consuming points are: $0.60 to Ivy Rock, Pa.; $0.65 to Phoenixville, Pa.; $0.80 to Coatesville, Pa.; $0.85 to Bethlehem, Pa., Reading, Pa., and Roebling, N. J.; $1.10 to Pottsville, Pa., Lebanon, Pa., and Columbia, Pa.; $1.20 to Harrisburg and Steelton, Pa.; $1.40 to Milton, Pa.

STANLEY RULED

That Expert Might Express Opinions As to Earnings.

G. M. Freer, of Columbus, O., commercial traffic manager for the Pittsburgh coal interests and other interests, appeared March 11, before the Stanley committee investigating the Unites States Steel Corporation. He testified that the Duluth, Missabe & Northern and Duluth & Iron Range railroads are subsidiary companies of the Steel Corporation and are engaged in the transportation of iron ore from the Minnesota ore region to the Lake Superior docks. He stated these roads charged 80 cents a ton for transporting ore between these, while the cost to the roads was but 24 cents per ton. He declared the Missabe road earned 240 per cent on its capital stock and in this manner paid what was tantamount to large rebates.

There was objection on the part of Attorney Reed to the opinion expressed by Mr. Freer as to the high rate of earnings. He declared Freer was not competent to express an opinion as to whether or not the carnings were exorbitant. Chairman Stanley ruled the witness was competent to express an opinion. An appeal was taken from the decision of the chair, which was sustained by a strict party vote.

Unsuccessful efforts were made by Chairman Stanley and Representatives Young and Bartlett to ascertain the value of the road. It is capitalized at $4,500,000, and its bonded interests $13,966,000. In 1910 it earned $650,000, the latest figures obtainable. It was developed that the Minnesota railroad commission fixed the physical valuation of the road in 1907, at $27,000,000, but Attorney Reed stated that since then several millions of dollars have been expended in extending the road and in improvements.

Representative Gardner of Massachusetts stated that it could not be decided whether the earnings were excessive when judged by the profits as measured by the amount of capital stock and bonded debt. He added that the capitalization of the Duluth, Missabe & Northern was very small as compared with the valuation of the road. This valuation was not ascertained by the committee. Mr. Freer assented to the proposition that the question of reasonable earnings could not be judged by capitalization, especially if it was fixed below the value of the property.

In response to question by Chairman Stanley, Mr. Freer stated in 1910 the total ore tonnage transported by all roads was 43,442,397. Of this amount, the Pittsburgh Steamship Co., a subsidiary of the United States Steel Corporation, transported 13,410,000 tons. This traffic was from the Lake Superior regions to Conneaut, Cleveland, Chicago and other lake ports. The rate on iron ore from the head of the lakes to lower lake ports was 65 cents a ton. The rate on coal on return trip was 30 cents a ton. Fifteen cents per ton was paid to dock companies for unloading. No profit was made on the transportation of coal and coke, the witness stated. The Pittsburgh Steamship Co. made a profit of 24½ cents a ton on transportation of iron ore. This profit, Freer stated, was based on the cost of operating expenses and the difference between the rates on ore and coal, there being no profit on coal. This company did not transport all its own ore. There was no difference between the rates on ore and coal between the Pittsburgh Steamship Co. and other water transportation companies.

The dock companies, the witness stated, charged the vessel companies 15 cents a ton for transferring ore from vessels to cars and the railroads paid to dock companies 2 cents a ton when loaded direct from vessel to car. When re-loading service is performed the railroads paid 10 cents additional per ton.

He declared the Bessemer & Lake Erie railroad transported ore from the Conneaut district. All shipments went to the Pittsburgh district, the rate being 96 cents a gross ton. The distance is approximately 140 miles. The net earnings of the Bessemer & Lake Erie Railroad Co. during 1910, were $3,728,357.. The road, the witness declared, is operated by the United States Steel Corporation. This rate was made at a conference between the railroads engaged in traffic from the various lake ports.

Attorney Reed asserted the Bessemer & Lake Erie road did not participate in this conference, but fixed the rate adopted at the conference by the other roads.

Hearing Resumed

At the resumption of the investigation of the hearing, Mr. Freer continued his testimony. Chairman Stanley interrogated him regarding proportional rates from Conneaut docks to various points. He stated the Bessemer & Lake Erie railroad, a subsidiary of the United States Steel Corporation, received 55 per cent of the rate on ore from Conneaut to Buffalo by the Buffalo, Rochester & Pittsburgh railroad, and 64.9 per cent by the New York, Chicago & St. Louis railroad. From Conneaut to Chicago the B. & L. E. railroad received 33 3-10 per cent of the rate on ore shipped by the N. Y. C. & St. L. route.

Attorney Reed, representing the United States Steel Corporation, suggested the value of the testimony was impaired by the fact that the mileage was not given. Then followed a technical discussion regarding divisions of rates to various points, which had no particular bearing on the point at issue.

Chairman Stanley stated the United States Steel Corporation had received what amounted to a rebate on a consignment of rails it sold to the Kansas City & Southern railroad, delivered at Jaudon, Mo., through the division of rates. He asked the witness regarding the rates on this shipment. Mr. Freer stated the published rate from Gary, Ind., to Kansas City is $2.75 a ton on rails. The division is 59 cents to the Elgin, Joliet & Eastern, and $2.16 to the Chicago & Alton.

But the Kansas City & Southern, the witness declared, had the shipment consigned to Jaudon, a point on its own lines, 33 miles from Kansas City. A special division was made on this shipment, the $2.75 rate being apportioned between the roads transporting the shipment. The Elgin, Joliet & Eastern road 40 cents; Chicago & Alton $1.10 for a haul of 500 miles, and the Kansas City & Southern $1.25 for haul of 33 miles. This, Mr. Freer stated, was in effect a rebate, the Kansas City & Southern paying itself $1.25 for the short haul on shipment of its own rails, and enabling the United States Steel Corporation to undersell its competitors by reason of the special division of the rate. Freer did not know whether similar divisions were made from other mills.

F. C. Baird, general freight agent of the Bessemer & Lake Erie railroad, said the advantage of the ownership of this road by the United States Steel Corporation was in keeping the steel mills in constant operation. He said the switching facilities of the trunk lines were totally inadequate for the handling of ore. Ownership by the Steel Corporation meant that plenty of ore was supplied and the employes of the mills were kept at work. In response to question by Representative Gardner, of Massachusetts, the witness said the independent ownership would destroy co-ordination, impair efficiency and interfere with the operation of the mills. Mr. Gardner desired to know if some law could not be enacted by congress which would forbid the industrial companies to control their own railroad lines and asked the opinion of Mr. Freer on this proposition. Freer stated he believed such a law would be constitutional. Representative Bartlett, of Georgia, expressed some doubt as to whether congress had such authority.

RUINOUS COMPETITION

Discussed by Bridge Builders—May Favor Taft Commission.

The monthly meeting of the Bridge Builders' Association of the United States was held March 8 and 9 at the Fort Pitt Hotel of Pittsburgh, and all but three erecting companies were represented, these being in the extreme west. The feature of this meeting was the presence of representatives of leading independent steel companies, supplying plain material, who discussed with the erectors present the open market policy that has been the rule of the association for some years, and were given a better understanding of conditions today, and of a way that could assist the builders in improving these conditions. The discussions were entirely informal.

At the February meeting, a committee on "Business Conditions" was appointed to outline a plan of campaign to bring about a better situation in the structural and erecting trades. This committee reported progress, and it is believed that it will be able to make a definite report at the April meeting. While there is now no clearly defined sentiment, there is an undertone among the erecting companies in favor of the proposed industrial commission that has been suggested by President Taft, or some such organization as will prove sufficient in power to check needless and ruinous competition in business. None of those present felt much encouraged over the outlook for this year, because of the prices at which business is being taken. It was freely predicted that unless some change takes place, very serious consequences will come.

In addition to this discussion there was a great interest taken in the adoption of a standard specification for railroad bridges. This subject is now in the hands of a committee that has been working on it for some time. The bridge building companies believe that it is only through the adoption of some such standard that they can get down to a practical basis the same as the rail manufacturers and structural steel manufacturers. A preliminary report was presented, and it will be read finally at the April meeting to be held in New York, and will probably be adopted there.

During the visit of the delegates, a very pleasant luncheon was tendered them by W. C. Coffin, of the Jones & Laughlin Steel Co., at the Pittsburgh Athletic Club. Other social events were also much enjoyed. The companies represented, and their representatives were as follows:

A. H. Cordery, Philadelphia Iron Co.
C. M. Fitts, New England Structural Iron Works, Boston.
B. H. Andrews, Boston Bridge Works.
J. S. Deans, Phoenix Bridge Co., Phoenixville, Pa.
C. E. Michaels, Virginia Bridge & Iron Co., Roanoke, Va.
Harry Fuller, King Bridge Co., Cleveland.
J. H. Lesh, Riverside Iron Co., Martins Ferry, O.
G. T. Hoiton, Chicago Bridge & Iron Co., Chicago.
Thos. Earle, Pennsylvania Steel Co., Steelton, Pa.
T. A. Straub, Fort Pitt Bridge Co., Pittsburgh.
H. R. Richards, Noelke-Richards Iron Works, Indianapolis.
Julius Gadd, Levering & Garrigues, New York.
C. D. Marshall, McClintic-Marshall Construction Co., Pittsburgh.
F. M. Bowman, Riter-Conley Mfg. Co., Pittsburgh.
J. T. Nichols, Lackawanna Bridge Co., Buffalo.
Mr. Satherwaite, L. T. Shoemaker Co., Philadelphia.
J. L. Haines, Jones & Laughlin Steel Co., Pittsburgh.
R. V. Sage, Cambria Steel Co., Johnstown, Pa.
Chas. R. Robinson, general agent, Lackawanna Steel Co.
Fred Krebs, Cambria Steel Co.

C. D. Marshall was chairman, and J. V. W. Reynders, vice president of the Pennsylvania Steel Co., was vice-chairman.

ANNUAL MEETING

Of Cincinnati Metal Trades Held In That City March 7.

The annual meeting and dinner of the Cincinnati branch of the National Metal Trades Association, was held at the Business Men's Club, Cincinnati, on March 7. The report made by Assistant Secretary William Dickson, of the local branch, showed a membership amounting to 98 per cent of the metal trades industry of that locality. A total of 6,000 mechanics was placed in various shops out of a total application of 9,000 during the past year. His attack upon the "eight hour" bill now before congress, then led to a decision to send a delegation of three members to Washington at once to protest to the committee of education and labor of the senate, against the passage of the bill. The speakers of the evening were: Henry D. Sharpe, president of the Brown & Sharpe Mfg. Co., Providence, R. I.; F. C. Caldwell, of the H. W. Caldwell & Son Co., and E. E. Bartlett, of Boston. The two former are vice president and president respectively of the National Metal Trades Association. The officers elected by the branch for the ensuing year were: President, Henry Ritter; vice president, P. O. Geier; treasurer, Emil Von Wyck; secretary, George Krapp, and assistant secretary, William Dickson.

BOOKINGS EXCEED

Shipments of Corporation in February—Gain of 74,479 Tons.

Further increase of the tonnage on the books of the United States Steel Corporation, awaiting manufacture, was shown by the monthly statement covering February, which was issued March 9. This disclosed a volume of 5,454,200 tons unfilled, Feb. 29, 1911, or a gain of 74,479 tons over January. While the increase is relatively small, it is very favorable as showing a sustained inflow of new business to the leading producer. This has offset a very heavy shipping movement in February, which was probably at the highest point of the past several months, when average operations were around 85 per cent of capacity. Before the issuance of the statement there had been many predictions that a decline in tonnage would be revealed.

Since the plan of making monthly statements of unfilled tonnage has been followed by the Corporation, the statements of business on hand, the tonnage and percentages of increase or decline from the previous month, have been as follows:

Date.	Total.	Change, tonnage.	Change, per cent.
Dec. 29, 1912....	5,454,200	74,479+	1.38+
Jan. 31, 1912....	5,379,721	294,960+	5.71+
Dec. 31, 1911....	5,084,761	942,806+	23.24+
Nov. 30, 1911....	4,141,955	447,627+	12.06+
Oct. 31, 1911....	3,694,328	83,011+	2.25+
Sept. 30, 1911....	3,611,317	84,668—	2.34—
Aug. 31, 1911....	3,695,985	111,900+	3.33+
July 31, 1911....	3,584,085	223,027+	7.16+
June 30, 1911....	3,361,058	247,871+	7.96+
May 31, 1911....	3,113,187	105,617—	3.28—
Apr. 30, 1911....	3,218,704	228,597—	6.63—
Mar. 31, 1911....	3,447,301	46,758+	1.37+
Feb. 28, 1911....	3,400,543	289,624+	9.31+
Jan. 31, 1911....	3,110,919	436,162+	16.30+
Dec. 31, 1910....	2,674,757	85,656—	3.09—
Nov. 30, 1910....	2,760,413	111,536—	3.88—
Oct. 31, 1910....	2,871,949	286,157—	9.12—
Sept. 30, 1910....	3,158,106	379,088—	10.74—
Aug. 31, 1910....	3,537,128	433,803—	10.92—
July 31, 1910....	3,910,931	286,863—	6.72—
June 30, 1910....	4,257,794	.....	....

Arranging New Offices

The Cincinnati branch of the Jones & Laughlin Steel Co., of which Boyden Kinsey is district sales manager, is arranging new offices at 1209 Union Trust building, which, when completed, will be among the finest and most commodious of their kind in that vicinity. The recent addition of wire products to the other materials sold by the company, together with increasing business, has made a larger office force and larger quarters a necessity. The new offices will be ready for occupancy in about a week.

The Woodward Iron Co. has begun work of tearing down its furnace at Woodward, Ala., and will erect a new stack.

METAL MARKETS

Chicago

Chicago, March 11.

New Metals.—The past week was characterized by a very good demand for copper and prices are firm on account of the report of the Copper Producers' Association, showing a curtailment of production amounting to over 3,000,000 pounds, accompanied by similar reduction in stocks on hand. Spelter has been very active during the past week and is approaching a new high record. Current quotations are 6.75c, Chicago.

We qote, dealers' selling prices, f. o. b. Chicago, as follows:

Lake copper, carload lots, 14¾c, casting, 14¼c; smaller lots, ¼c to ¾c higher. Spelter, car lots, 6.75c; lead, desilverized, 4c in 50-ton lots; corroding, 25c per 100 pounds higher; sheet zinc, $8.50 list, f. o. b. La Salle, in car lots of 600-pound casks; pig tin, 43¼c. Cookson's antimony, 8½c; other grades, 7½c to 8c.

Old Metals.—The extremely firm market for new copper is reflected in the old metal market and prices of copper and brass are strong. Aluminum is also fairly active. Prices in general are following the trend of the new metal market.

We quote, dealers' selling prices, f. o. b. Chicago, as follows:

Copper wire, crucible shapes, 13c; copper bottoms, 11½c; heavy cut crucible copper, 13c; heavy red brass, 11¾c; heavy yellow brass, 9½c; No. 1 red brass borings, 9½c; No. 1 yellow brass borings, 8¼c; brass clippings, 9c; lead pipe, 3½c; zinc scrap, 4¼c; scrap aluminum, 12c; tea lead, 3¾c; No. 1 pewter, 28c; block tin pipe, 39c; tin foil, 35c; linotype dross, 3¼c; electrotype dross, 3c; stereotype plates, 4½c; stereotype dross, 3¼c; prime slab zinc dross, $90 a ton.

New York

March 12.

Tin.—The prices of pig tin have held remarkably well in view of the serious labor trouble abroad. Daily fluctuations have been wide in several instances, but when declines seemed threatening, the leading foreign interests supported the market and quickly brought about a recovery. Domestic consumers have been active buyers during the past week. It is probable that sales of 1,000 tons or more have been made for March, April and May shipment to interior points. The price range was between 42.75c and 43.50c on spot and 42c to 43.25c on futures. At the close of the foreign market today domestic prices are about at parity with London quotations. Spot is 42.87½c, March 42.75c and April 42.25c. In London, spot closed at £192 and three months at £187 10s. Arrivals of tin since March 1 are 1,244 tons, and there are 1,876 tons afloat.

Copper. — The statement of the Copper Producers' Association did not show as large a reduction in stocks as was generally expected. The decrease during February was only 3,340,655 pounds, whereas the most of the local trade expected a reduction of between 10,000,000 and 15,000,000 pounds. Prices, however, have held firm and it is considered a strong expression of the general opinion of what the future of the copper market is likely to be, that they did not decline. All leading sellers are asking 14.62½c for electrolytic, delivered 30 days, and 14.50c cash, New York. Lake is 14.62½c to 14.75c, and casting 14.37½c to 14.50c. Consumers have not bought in large volume during the past week, sentiment being unfavorably effected by the European labor complications. Copper exports since March 1 are 10,482 tons.

Lead.—Consumers are being freely supplied with lead at 4c in New York, by the leading seller. The demand, however, is not as large as it was during February. Independent sellers are quoting prompt shipments at 4.10c in New York.

Spelter.—There is a larger demand for prompt shipment metal in this market, and with the great scarcity of the metal that prevails, an attempt to attract offerings by bidding the market up is not considered unlikely. Prime western for prompt and March delivery sold here today at 7.05c in New York. April and May have been disposed of at 6.95c and 6.75c, respectively.

Antimony.—The market is slightly stronger. Cookson's is 7.25c to 7.37½c, Hallett's is 7.37½c, and Hungarian is 6.80c.

Will Build 40 Ovens

The By-Product Coke Corporation of Chicago has announced its intention of building 40 new Solvay ovens at its plant at South Deering. This will increase the capacity of the plant about 25 per cent, since 200 ovens are now in operation. The By-Product Coke Corporation is affiliated with the Semet-Solvay Co. and its selling agents are Pickands, Brown & Co., Chicago and Milwaukee. The ovens at South Deering produce foundry, blast furnace and domestic coke for the market. The surplus gas is sold to the Peoples' Gas Light & Coke Co., of Chicago.

IMPORTANT ADDITIONS

Will be Made to the Plant of the Indiana Steel Co.

The Inland Steel Co., Chicago, has definitely announced a construction program which will result in important increases to the capacity of its plant at Indiana Harbor. Four new 60-ton, stationary open-hearth furnaces will be built, increasing the steel-making capacity by 50 per cent, there being eight furnaces in operation at present. A 90-inch, 3-high shear plate mill will also be built and minor improvements will be made to the existing mills to reduce the cost of production. Work on this new construction will commence as soon as possible and will be pushed vigorously, it being the intention of the company to further diversify its product. The company has recently completed an additional blast furnace, which will have a daily capacity of 350 tons. These improvements will constitute an important addition to the steel-making capacity of the Chicago district and indicate the substantial growth in the demand for steel throughout the west which has been experienced during the past two years in spite of unsatisfactory business conditions. It also reflects the excellent financial condition of the Inland Steel Co

No money will be borrowed to finance the new construction. At a meeting held March 5, the stockholders adopted a resolution increasing the capital of the company from $7,500,000 to $10,000,000. At the present time the company has outstanding about 70,000 shares with a par value of $7,000,000. About $1,000,000 in new capital will be issued at once, the balance, $2,000,000, being held in the treasury for future requirements. Stockholders of record on March 5, are given the right to subscribe for an amount of new stock equal to 15 per cent of their respective holdings, the price being $125 per share. The par value of the new stock is the same as that previously issued, namely $100 per share.

The eastern offices and warehouses of Edgar Allen & Co., Ltd., high grade tool steel, are now located at 86 John street, New York. A complete stock of steel for meeting the prompt requirements of its customers is carried at this location.

The American Car & Foundry Co. has declared the regular quarterly dividend of 1¾ per cent on preferred and one-half of 1 per cent on common stock, both payable April 1.

Control of Mixtures for Cast Iron Car Wheels

The Advantages of the Microscope in Car Wheel Practice and Some Remarkable Examples of Cast Iron Chills

By Asa W Whitney

As a car wheel maker, the recurrent discussion of the percentage of charcoal iron in car wheels, recently published in THE IRON TRADE REVIEW, interested me very much, particularly the criticisms of the metallurgical practice. Referring to Alexander E. Outerbridge's letter published in the issue of Jan. 13, 1912, it appears to me that Mr. Outerbridge is correct when he states that 20,000 wheels made per day in the United States and Canada is an excessive statement, if only 23.30 and 33-inch steam and electric road car wheels were included in this total. While I have never seen any statistics covering car wheel output, but assuming 400 pounds is the average weight of car wheels, which includes the lightest mine wheels and the heaviest standard wheels from 50 to 750 pounds in weight, it would seem that the possible maximum capacity per day is 4,000 net tons. This is based on an output of 20,000 wheels per day, including all sizes of car wheels, and estimating 300 working days per year, the total car wheel tonnage would aggregate annually 1,200,000. Assuming that the charcoal pig iron produced in 1911, not including cold blast iron, was 400,000 tons, it is probable that not more than 80 per cent was available for wheel mixtures or approximately 320,000 gross tons. Assuming that the output of car wheels in 1911 was more than 1,200,000 net tons, it follows that approximately 30 per cent of this iron was available for the total car wheel iron mixtures. It is unlikely, however, that more than 80 per cent of the car wheel tonnage in 1911 contained any charcoal iron whatever. My contention is that it was not required for making chilled wheels and was consumed in other practice.

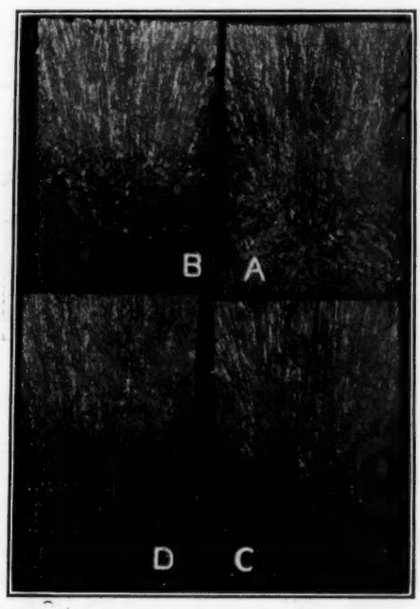


FIG. 1—SCRAP MIXTURES, SHOWING CHILLED FRACTURES OF TEST BARS

FIG. 2—CROSS-SECTION OF BAR MADE FROM A SCRAP MIXTURE, REDUCED ONE-HALF

Mileage of Wheels

At one time, 75 per cent or more of the cold blast charcoal iron output was used in wheel mixtures, but since that period the mileage of the wheels in most severe service has dropped to about one-third the maximum of former days. This, however, is offset by the following:

Doubling the weight of the wheel did not double the area of contact with the rail.

When a high percentage of cold blast charcoal iron was used in wheel mixtures, the loads were about one-fifth and the speeds about one-third as great as they are today. Therefore, the shock and wear on the treads and flanges was much less in former days, especially since the rails in use were made either of wrought iron or soft steel. Today the steel used in the manufacture of rails contains from 75 to 100 per cent of pearlite and is frequently hardened by alloys. The more rigid roadbed of today also increases the shock on the flanges and treads wherever the slightest imperfections of the rail or wheel exist.

Ample evidence of the superior physical properties of cold blast pig iron as compared with hot blast iron is available and care should be exercised in remelting to preserve the proper superiority of cold blast iron. To promote the use of warm and hot blast charcoal iron, every effort has been made by foundry chemists and metallurgists, and today these grades, to a large extent, are eliminated in favor of other grades of iron, which are physically inferior to hot and cold blast charcoal.

The next step in the development of car wheel practice consisted of the addition of powdered ferro-mangnese in the ladle. This was done by Alexander E. Outerbridge at A. Whitney & Son's car wheel works, at Philadelphia. The powdered ferro-manganese was added to the metal in a 600-pound wheel-pouring ladle while it was being filled from an 8-ton iron mixer, which received concomitant and consecutive taps of metal from three cupolas. Strange as it may seem, the mixer was patented years later and applied in the steel industry. In 1888 I discontinued adding ferro-manganese to wheel iron in the ladle, except for emergencies and for lighter wheels for which the cupola metal was not especially intended.

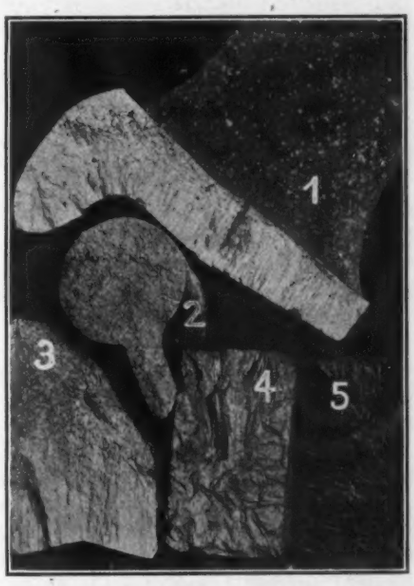


FIG. 3—EXAMPLES OF CAR WHEEL CHILLS

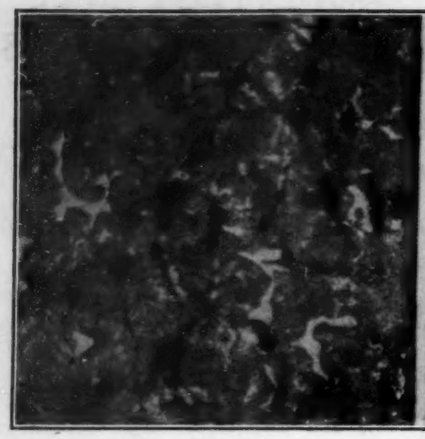


FIG. 4—MICRO-PHOTOGRAPH OF SAMPLE *B*

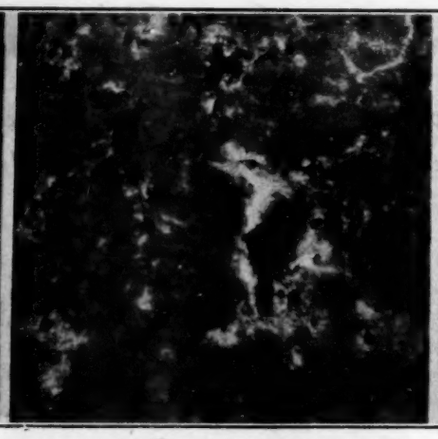


FIG. 5 — MICRO-PHOTOGRAPH OF SAMPLE *B*, COOLED MORE SLOWLY THAN METAL SHOWN IN FIG 4.

FIG. 6—MICRO-PHOTOGRAPH OF EXCEEDINGLY HARD IRON, CONTAINING 57 PER CENT CEMENTITE AND 43 PER CENT PEARLITE

Later, however, I adjusted all mixtures separately and more accurately for light and heavy wheels, seldom having recourse to ladle dosing, which has serious disadvantages in small amounts of cooling iron. Since 1890 I have added ferro-manganese and other alloys to the cupola charge, the mixture being carefully adjusted for every purpose. This same practice prevails today for all classes of castings, both chilled and soft.

The composition of the metal must be varied with the weights and cross-sections of the wheels which govern the rate of cooling and the consequent grain size of the ferrite, pearlite, cementite and graphite. These are essential structural elements. In the early days of car wheel manufacture, with the manganese below 0.30 per cent, the

Table I.

	Good wheel per cent.	Poor wheel per cent.
Combined carbon	0.54	1.17
Graphitic carbon	3.30	2.36
Total carbon	3.84	3.53
Silicon	0.69	0.65
Manganese	0.13	0.12
Phosphorus	0.43	0.52
Sulphur	0.12	0.19

specification for sulphur provided for less than 0.08 per cent. Today, notwithstanding the higher manganese content and the heavier wheels in use, 0.17 to 0.19 per cent sulphur is the maximum and 0.25 per cent sulphur is out of the question. The attainment of metal especially low in sulphur, the use of any one brand or grade of iron and the use of steel because of its strength or the facility with which either high or low carbon metal may be obtained, will not insure the highest quality in chilled wheels or in any other kind of iron castings, where varying physical and market conditions must be met. I, therefore, will direct attention to the enormous difference in physical properties due to minute differences in the chemical analyses. At one time it was believed that the chemical analyses of car wheels would not afford a sufficient clue to the resultant enormous differences in physical properties. The causes for these differences, however, have been cleared by metallography.

Chemical and Physical Properties Compared

In 1888 the late Dr. Dudley made a report upon two Pennsylvania railroad, standard size car wheels, which was published in the *Charcoal Iron Workers' Journal*, Vol. 7. The good wheel, before breaking, was subjected to 150 blows with a 25-pound sledge, while the poor wheel was broken with eight blows. The analyses of these wheels are shown in Table 1.

At that time attempts at proximate analyses were not very satisfactory, and I understand that my calculation of proximate compositions on chemical data and of structure on metallographic principles, published in the proceedings of the American Society for Testing Materials in 1902, page 203, afforded the first explanation on an entirely practical basis. My recommendations, however, were considered too radical for those who believed that strong iron could not be made from the most plentiful and convenient melting materials which can be skillfully adjusted to give any required physical structure at the lowest net cost.

The more nearly the chemical and physical properties of the melting stock approximate those of the product, the more difficult it becomes to carry high percentages of the product as scrap or to carry a high percentage of steel and cheap iron with high chilling strong metal, notwithstanding the use of alloys. Railroad car wheels must have an accurately adjusted composition for each class or weight and the structure must be and can be better adjusted to afford more regular results than are obtained at the present time. Mixtures for iron castings as well as steel should be made and melted on a scientific basis. The scrap, pig and alloys should be selected entirely with reference to every stage of the process to obtain a molten metal of such composition that will separate suitably into the desired proportions of the structural components required.

The proximate compositions of the two wheels previously referred to will

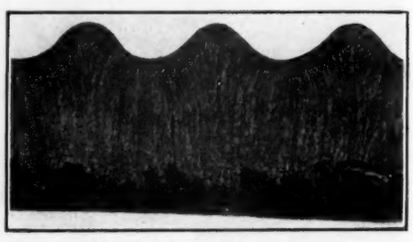


FIG. 7—THREE-INCH CHILL ON CRUSHER JAW

be omitted, but the structural compositions are interesting and are as follows:

	Good wheel per cent.	Poor wheel per cent.
Pearlite	67.31	86.880
Excess ferrite	26.514	none
Carbon as graphite.....	3.30	2.36
Fe_3S	3.121	0.329
Fe_3P	2.755	3.322
Excess cementite	none	7.10

The good wheel had a steel and iron structure while the poor wheel was harder and was practically a weaker

steel, the strength of which was still further reduced by excess cementite.

Another interesting comparison of two mixtures of iron which developed widely varying physical properties proved our previous contention with reference to making these mixtures. The analyses of these two mixtures are given below:

	A Per cent.	B Per cent.
Combined carbon	0.530	0.49
Graphitic carbon	2.907	2.21
Total carbon	3.437	2.70
Silicon	1.05	1.786
Manganese	0.395	0.822
Phosphorus	0.04	0.615
Sulphur	0.015	0.10
Copper	0.02	none

The structural compositions of A and B follow:

	A Per cent.	B Per cent.
Pearlite	66.2	61.337
Ferrite	33.817	32.518
Fe_3P	0.286	3.935
Graphite	3.06	2.21

Sample *A* consisted of a 2-inch square bar, 13 inches long, planed from the center of cheap coke pig iron, costing $13 per net ton. A test bar made from the 2-inch square bar turned to 1 inch area and ½ inch in diameter at the center, developed a tensile strength of 37,700 pounds per square inch.

Sample *B* was made of 97 per cent scrap, mixed with 3 per cent of alloys and cost $12 per ton. It was used for brake shoes and similar work. The test bar had an area of 4 square inches and was 15 inches long. Bar *A*, 1 inch area at the center, developed a tensile strength of 35,840 pounds per square inch. A micro-photograph of a section of sample *B* is illustrated in Fig. 4 This shows the pearlite, ferrite and graphite. The phosphide of iron is visible in the ferrite in some places.

The microscope affords an easy method of ascertaining the structural composition. In samples *A* and *B* is found a good steel structure in both cases, but sample *B* is hardened and weakened by iron phosphide, notwithstanding the fact that it contains a lower percentage of graphite than *A*. Furthermore, the graphite is in a less harmful condition than that contained in *A*. A comparison of these analyses immediately indicates the best composition, which is attained at a lower cost.

Use of Ferro-Alloys

In my practice I frequently avoid all ferro-alloys, but use them occasionally for making hard mine wheels with light spokes. The amount of steel scrap is varied and while these wheels are guaranteed for five years, they are in service from 10 to 20 years. An analysis of this metal was pronounced by a chemist of wide experience in car wheel work, as wholly unfit for anything but a 750-pound wheel, yet for mine car wheels, 16 inches in diameter, it gives excellent satisfaction.

It is not a case of secret mixtures, but the problem involves close adjustments to conditions of any convenient and suitable composition by means of a few or many kinds of scrap and steel and the smallest amounts of alloys and pig iron. Since 1888 I have closely calculated every mixture and have proven that within the usual and unusual limits for each element contained in both good and bad compositions, that only on a metallographic basis can these compositions be satisfactorily determined. Years ago I learned that there was no advantage in using expensive material, except when it increases the output at a lower cost than a mixture of cheaper first cost.

Test Bar Fractures

In Fig. 1 are shown the fractures of four test bars, which further will prove my contentions. The bar *A* was made of a mixture containing 99 per cent scrap and 1 per cent alloys and cost $10.48 per ton; *B* contains 99 3-10 per cent scrap and costs $9.80 per ton; *C* contains 91.2 per cent scrap and costs $8.43 per ton; *D* contains 91.3 per cent scrap and costs $13.01 per ton. While all of these mixtures are satisfactory for 4½-inch crusher jaws, nevertheless mixture *A* is best adapted for this work.

Interesting fractures of chilled iron are shown in Fig. 3. In this view, *1* shows the chill of the tread and flange of a mine car wheel; *2* is the chilled test piece of metal for mine wheels, the bar being 1⅛ inches in diameter; *3* is the chilled part of a chilled test piece of mine wheel metal; *4* shows a fracture of an especially hard iron made in 1892 and *5* shows the fracture of a test bar, both sides being chilled toward the center.

Fig. 2 shows a fracture of a test bar of a mixture made for a high chill and exceedingly strong iron. No pig iron was used in this mixture, which contained different grades of scrap and steel. The alloy addition consisted of 0.2 per cent of ferro-titanium which contained 12 per cent of titanium. This addition was made in the cupola. This bar was 11 inches long and has been reduced one-half.

Fig. 5 is a micro-photograph of a section of mixture *B*, previously referred to, which was cooled more slowly than Fig. 4. This shows the junction of large masses of large pearlite grains partly separated by ferrite and graphite.

In Fig. 6 is shown a micro-photograph of the hardest iron I have yet made, which contains 57 per cent cementite and 43 per cent of pearlite.

Fig. 7 shows 3 inches of perfect chill in a crusher jaw, 14¼ x 4 inches cross-section.

Fig. 8 is a micro-photograph of the metal ⅜ inch below the surface of a chilled test piece for 630-pound wheels. This test piece was not annealed. It

FIG. 8—MICRO-PHOTOGRAPH OF METAL ⅜ INCH BELOW SURFACE

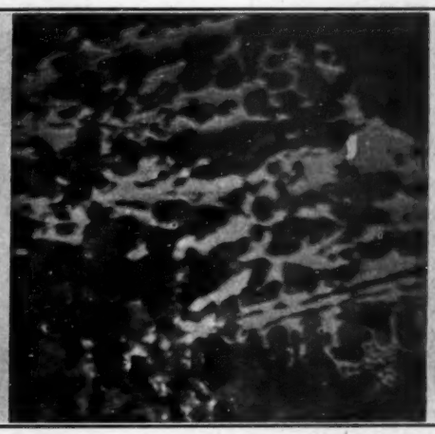


FIG. 9—MICRO-PHOTOGRAPH, SHOWING GRAPHITE, WHICH WEAKENS THE CHILL

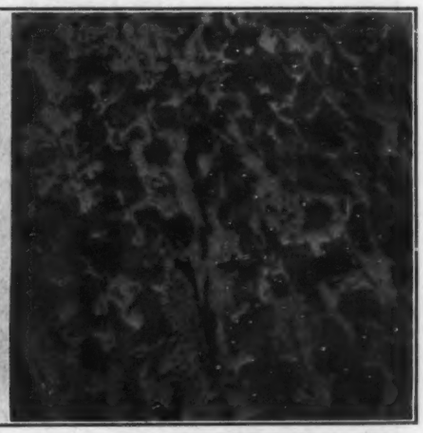


FIG. 10—MICRO-PHOTOGRAPH, SHOWING PEARLITE AND CEMENTITE, BUT NO GRAPHITE

will be noted that it contains practically no graphite and only a slight amount of manganese sulphide in the pearlite.

Fig. 9 is a micro-photograph magnified 149 diameters, which shows the metal 7-16 inch below the tread of a 660-pound, 33-inch wheel, which failed in the tread and flange after a life of 10,000 miles. The darkest spots are the graphite which reduced the strength of the chill. Pearlite and cementite also are shown.

Fig. 10 is a micro-photograph 5/8 inch below the surface of a 24-inch wheel, made without charcoal iron or ladle dosing. The wheel was annealed in 42 hours. The chill in this wheel varied from 1¼ to 1½ inches. It will be noted that no graphite spots can be seen and, therefore, the chill was not weakened in this way.

The Hewlett Core Machine

There are three general types of core machines in use in this country. In the first type the sand is forced through a die forming round, square or irregular shaped cores with parallel sides; the second type is similar to the ordinary roll-over or jolt-ramming machine in which the core box takes the place of the pattern, while in the third type the sand is rammed into the core box by air pressure. The Hewlett core machine manufactured by Wm. Demmler & Bros., Kewanee, Ill., is an example of the third type. An improved model of this machine has recently been placed on the market, the details of which are shown in the accompanying illustrations.

Referring to Fig. 1, the sand is placed in the cylindrical holder shown in the foreground, from which it is carried by a simple elevator to the upper sand hopper located at the top of the machine. The holder has a capacity of three cubic feet. The sand is fed to the elevator by a graduated feeding device which can be regulated to furnish the proper quantity for cores of any size. From the upper hopper the sand passes into the lower or feeding hopper, *H*, Fig. 1. This hopper is secured to the under side of a sliding plate, *X*, which is worked slowly back and forth by a crank and link-work attached to the fly-wheel. When the plate, *X*, is at one end of its stroke, hopper *H* is in communication with the upper hopper and is filled; when the plate is at the opposite end of its stroke, compressed air is admitted to the hopper through the valve, *V*. The hopper, which is now directly over the core box held in the chuck on the table, *T*, has a flat plate across the bottom through which two small holes are drilled. The pressure of the air forces the sand through these holes into the core box. If the upper surface of the core is flat, this plate serves for the top of the core box; if the core is irregular, the box is closed on top, two holes being left for the admission of sand through the bottom of the feeding hopper.

The table, *T*, is adjustable and is provided with an automatic compressed air chuck which holds the core boxes securely while they are being filled and releases them as soon as the operation is completed. The valves controlling the admission of air to the chuck and feeding hopper are operated automatically by cams on the flywheel.

The sand in the upper hopper is kept from sticking by a revolving cutter. The machine is driven by a belt to a 16-inch clutch pulley running about 30 revolutions per minute. The fly-wheel, to which the crank and cams are attached, is so geared to the clutch pulley that it operates about 8 revolutions per minute.

The sliding plate, *X*, carrying the feeding hopper, therefore, makes about eight strokes and fills eight core boxes every minute. There may be several cores in each box. The frame of the machine is cast iron, box section, and is about 6½ feet high and 5 feet wide. The floor space required, including elevator, is approximately 30 square feet. Cores of very irregular shape can be made as easily on the Hewlett machine as plain ones, the air forcing the sand into pockets and angles in the core box. They may be made of oil sand, rosin mixture, glutrin

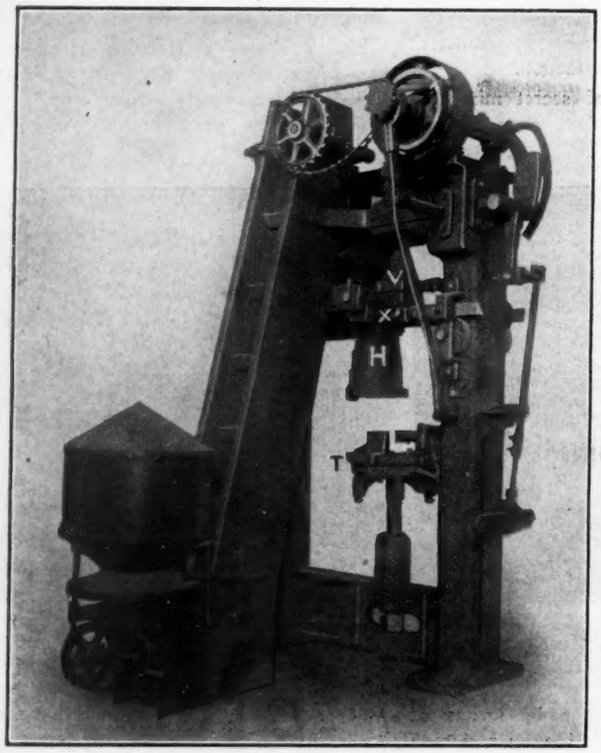


FIG. 1—HEWLETT CORE MACHINE, SHOWING SAND ELEVATOR

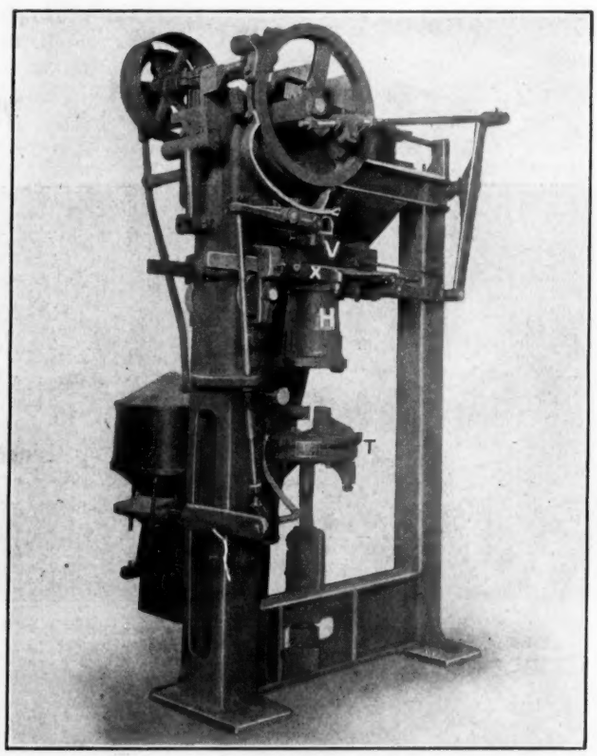


FIG. 2—CORE MACHINE, SHOWING FEEDING HOPPER AND TABLE

mixture, with a moderate quantity of flour, or of green sand. The pores are very fine, yet allow a good natural vent for the gases. It is claimed about 95 per cent of the cores made by this machine do not require additional venting.

In operating the machine, 80 pounds per square inch air pressure is required for oil and silica sand mixtures; 90 pounds for oil mixtures containing loam, while mixtures using resin, glutrin or flour require 100 to 115 pounds pressure. Where the line pressure in a plant is below these figures, a small auxiliary booster compressor is used.

The machine requires one horsepower to drive it and consumes about 12 cubic feet of free air per minute. It will make cores from 1 inch to 15 inches in length and will fill boxes using as much as 200 cubic inches of sand.

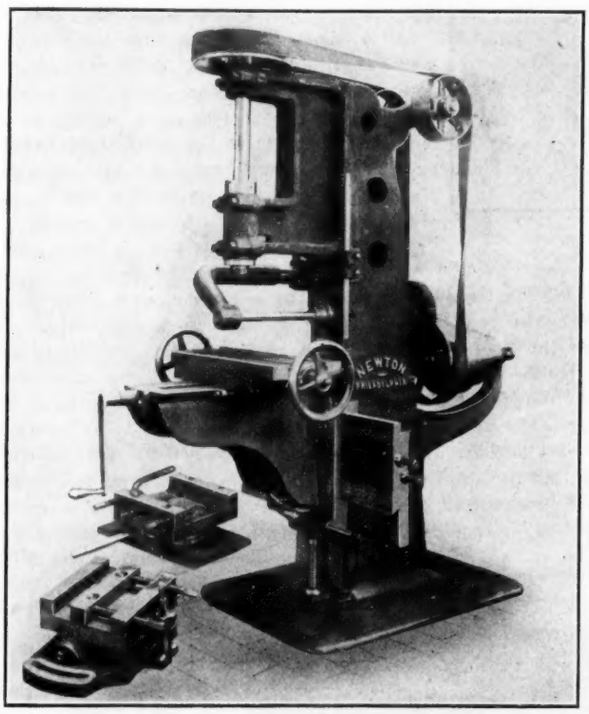


FIG. 1—NEWTON DIE-SINKING MACHINE WITH KNEE IN VERTICAL POSITION

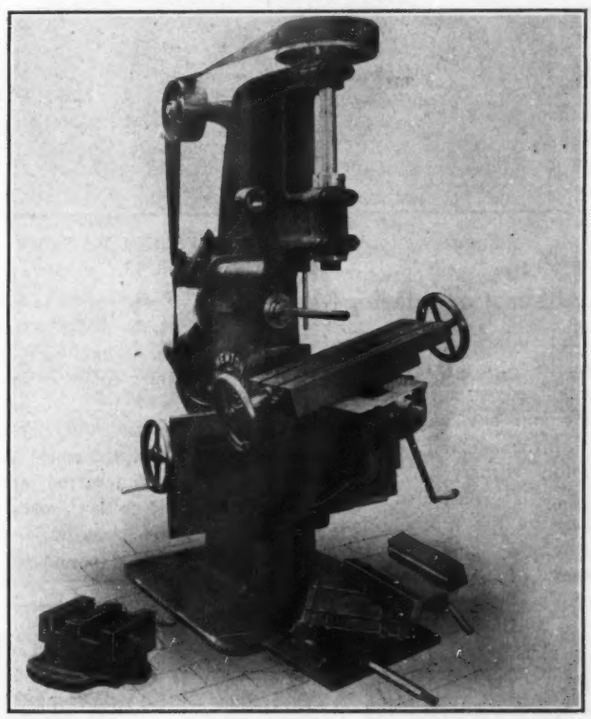


FIG. 2—KNEE OF DIE-SINKING MACHINE TILTED SLIGHTLY

Newton Die-Sinking Machine

A die-sinking machine, which is designed to eliminate the use of special angular cutters has been built by the Newton Machine Tool Works, Inc., Philadelphia. The use of these angular cutters is obviated by swiveling the knee upon which the work table is hung. The knee can be swiveled 20 degrees to either side of the vertical plane and by this arrangement both internal and external clearances can be milled with straight cutters. Fig. 1 shows the die-sinking machine with the knee in a vertical position and in Fig. 2, which is a front view, the knee is shown tilted.

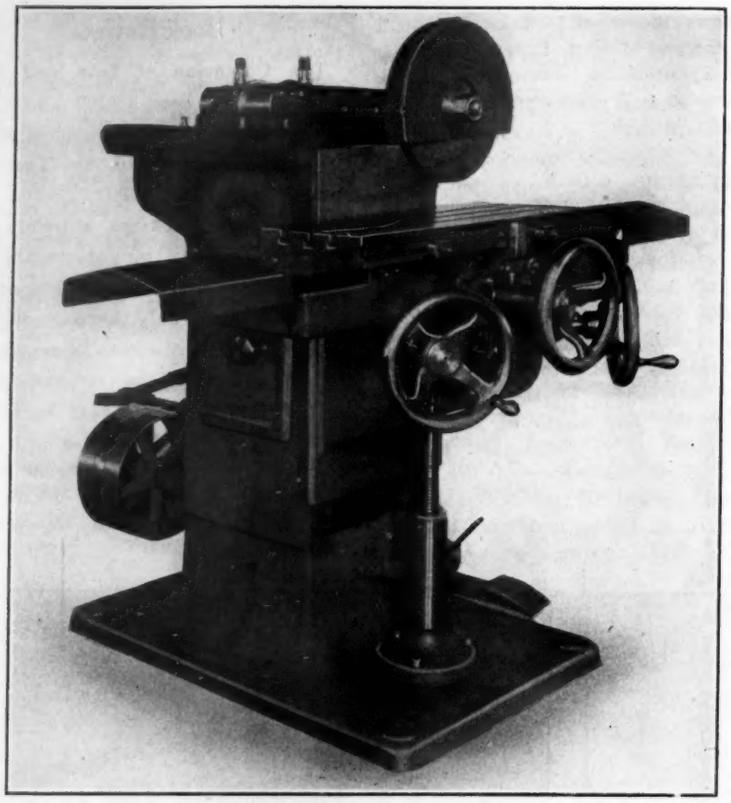
The machine is equipped with vertical and horizontal spindles, the horizontal spindle being supported by an overhanging arm which can be adjusted to clear the work when desired. The diameter of the horizontal spindle is 2⅛ inches and of the vertical spindle, 2⅝ inches. The length of the in and out adjustment of the table is 6 inches, while the length of the cross adjustment of the top table is 16 inches. The length of the vertical adjustment is 14 inches and the distance from the center of the spindle to the upright, 15 inches. The work table is 29 inches long and 11 inches wide. The rotating vise will admit work up to 8 inches in width and when the jaws are detached, a 12-inch flat surface for clamping the work table is available. The outer jaws of the tilting vise are cast solid and will admit work up to 12 inches in width. A clutch is provided on the drive to the horizontal spindle which may be operated independently or in unison with the vertical spindle. The weight of the machine is approximately 4,600 pounds.

Following the filing of a number of small suits, a receiver has been appointed for the Portsmouth Machine & Casting Co., Portsmouth, O., whose property is valued at $50,000.

Book Review

The Corrosion of Iron and Steel, by J. Newton Friend; 289 5 x 7½-inch pages; published by Longmans, Green & Co., and furnished by THE IRON TRADE REVIEW for $1.80.

This work discusses a timely subject, although it is unfortunate that the question of the protection of iron and steel has only been dealt with in-so-far as it concerns the problems of corrosion. However, the author states in the preface that he is now collecting material on the protection of iron and steel and in the future a companion volume will be devoted to the consideration of this subject The action of various corrosive influences upon iron is discussed in various chapters and considerable space is devoted to a consideration of the influence of chemical composition upon the corrodibility of iron, and electrical and galvanic action. The work concludes with a discussion of the relative rate of corrosion of iron and steel in which the results of various experiments published in the technical press, from time to time, are presented. Acceleration tests also receive considerable attention and it is claimed by the author that they should be regarded with due suspicion and that not too much reliability should be placed upon the results obtained by their aid.



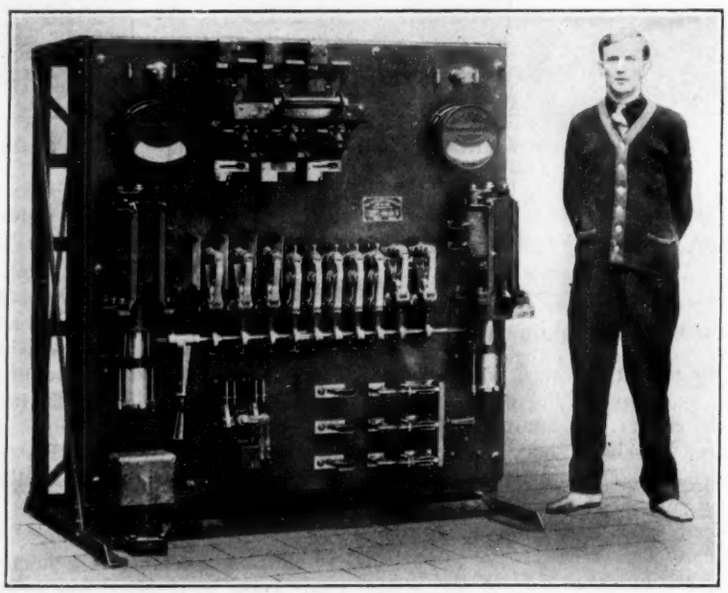
AUTOMATIC SURFACING MACHINE

Automatic Surfacing Machine

An automatic, dust-proof surfacing machine for grinding dies, chucks, straight edges, surface plates, typewriter parts and any work within the capacity of the machine, built by the Northampton Emery Wheel Co., Leeds, Mass., is illustrated herewith. The frame of the machine is of box type construction and the tables for machines of the three different sizes built, are respectively, 10 x 24 inches; 10 x 30 inches, and 10 x 36 inches. The machine is heavy in construction and will permit the operator to do rapid and accurate work. The machine is practically dust-proof as all of the cut gears are inside of the cabinet base and are lubricated through copper tubing leading from the compression grease cups outside of the base. Dust guards also are provided for all ways and exposed parts and a foot lever and clutch permit of stopping or starting the machine table at any desired point. The vertical feed is determined by a dial graduated in thousandths of an inch, and either automatic or hand feed of grinding and machine table adjustment can be employed. The size of the wheel on the arbor is 1 x 12 inches, while the arbor is 31 inches long. The arbor bearings are 4 inches in length and the diameter of the arbor through the bearings is 1 5-16 inches. The speed of the arbor is 1,600 revolutions per minute and that of the countershaft, 400 revolutions per minute. The height from the floor to the center of the arbor is 48 inches and the extreme distance from the top of the table to the lower edge of the 12 x 1-inch wheel is 7 3-4 inches. The width of the cut is adjustable from 1-64 to 1-8 inch and the weights of the three sizes of machines vary from 2,000 to 2,600 pounds.

Fire Pump Starter

The Cutler-Hammer Mfg. Co., Milwaukee, has increased its line of direct current fire pump starters by the addition of several types for use with alternating current motor-driven pumps. The automatic starting device, shown in the accompanying illustration, and installed in the Northwestern power station of the Commonwealth Edison Co., Chicago, provides for both automatic and hand operation. This equipment is used with a 225-horsepower, 220-volt, 60-cycle slip ring induction motor, which drives a centrifugal pump capable of delivering 2,000 gallons per minute at a pressure of 150 pounds. The cam-operated, butt-contact switches can be operated by the single hand lever, or automatically by the two solenoids placed at either end of the shaft, without the necessity for any adjustments. When the water pressure, in this particular case, drops to 135 pounds, due to the opening of hydrants or sprinkling heads, the automatic pressure governor starts the motor automatically. As fire pump service requires absolute-starting, solenoid-operated dash-pot controlled switches are employed to meet the rigid requirements of the Chicago and National Boards of Fire Underwriters. The lamp above one of the meters indicates when energy is available, while the other lamp indicates when the motor is in operation. A double throw, three-pole switch is provided for connection to two sources of current supply and a three-pole circuit breaker at the top of the panel is connected in the motor circuit.



CUTLER-HAMMER FIRE PUMP STARTER FOR USE WITH ALTERNATING CURRENT, MOTOR-DRIVEN PUMPS

Expense Burden: Its Incidence and Distribution[1]

Presentation of a Rational Method of Dividing and Estimating Factory Costs, With Suggestions for the Development of Burden Charges

By Sterling H Bunnell

As the various problems of engineering design and construction are reduced to the application of known rules, precedents and data, the element of cost enters more prominently into the calculations on which the choice of plans is based. Almost any engineering construction, whether railroad, bridge, tunnel, transmission line, factory or mechanical device, can now be produced with materials and methods in easy reach. The question, "Can it be done?" has given place in importance to "Will it afford an attractive return on the investment?" The engineer must now master, in addition to the mathematics of materials and of electricity, the problems of financial operation, the principles of estimating correctly and providing for fixed charges, as well as operating expense, and all the other details of accounting required for the continued successful operation of an enterprise after construction is finished.

Factory Burden

By far the most difficult of the problems presented for joint solution by the engineer and the accountant is that of the distribution of factory burden on correct principles. The original conception of burden treated it as a wholly unfortunate, objectionable and regrettable outlay, to be kept as small as possible, and subtracted from the gross profit of the factory operation to obtain the figures of net profit. Every possible effort was made to charge not only wages and material, but also repairs and supervision, in some way or other into the particular product that happened to be under construction. The residue of expense which could not be disposed of arbitrarily by this method was collected into a single expense account and distributed by proportion over the cost of the products. The usual method adopted for carrying out the calculation was to distribute the expense either as a percentage to cost of labor, or as an hourly charge to be added to the wages cost, of every hour's labor performed. Where this conception and practice exists, every bill that happens to be paid in a given month, or at the best, every charge incurred during that month, is regarded as expense to be distributed over the product of that month. If something breaks down and is repaired at heavy expense, the goods cost more that month because of making the repairs at that particular time. Accounting of this character has made it possible to operate many a factory at a huge profit, until the economically worn-out shell could be unloaded on some capitalist innocent enough to dispense with engineering advice, and purchase on the book figures of past operation.

Erroneous Basis of Distribution

The basis of this scheme of distributing burden by scattering it as evenly as possible over everything in sight is the wholly erroneous conception that all the operating expenses of the factory can be divided into two classes, productive and non-productive, the first including all useful work on the manufactures to be sold later, and the second all waste, a dead loss to the organization. The logical development of the theory teaches that the ratio of non-productive to productive expense should be kept as low as possible; the best manager is he whose expense ratio is the lowest; and increase of expense ratio by high-powered machinery, trained helpers to save the time of skilled workers, and liberal outlay for good tools and their upkeep, causes loss. The absurdity of the conclusion and therefore of the premise, is evident. No legitimate expense is truly non-productive and some other definition must be found for the expense burden in order to indicate its true significance.

Table I.

SCHEDULE OF EXPENSE.[1]

Interest on land and building....	$ 50.00
Depreciation 2½ per cent on $1,000 valuation	25.00
Taxes 1 per cent on $1,000.....	10.00
Insurance, per year	5.00
Heat and light, share of this building	50.00
Building repairs estimated at.....	25.00
Total building charge.....	$165.00
Interest on equipment 5 per cent on half new value.....	$168.25
Depreciation per schedule.....	407.00
Taxes 1 per cent on assessment..	39.00
Insurance	35.00
Total to distribute to equipment.	$649.25

Every task performed in a shop under good management is directed toward accomplishing quickly and cheaply some definite and useful end. The purposes served by the various details of the work differ widely. Some of the tasks are performed directly on particular pieces of the factory product and are properly called direct. Others, no less productive, are on miscellaneous lots of pieces, like cleaning castings in the foundry; or on several dissimilar pieces at once, as in operating a group of automatic machines. Others have no direct contact with factory product, as in repairing belts, operating cranes and sweeping floors. All of those tasks which cannot be conveniently split up, measured into portions and charged direct to particular pieces of factory product are properly described as indirect.

Expense Ratio

The ratio of indirect to direct expense is no indication of the efficiency of the management, except as between two precisely similar operations. In fact, a high ratio of direct to indirect may indicate extreme inefficiency, exactly the opposite of the accepted belief, and this under widely differing conditions; for instance, with a badly managed shop where every man charges his full time direct to a product, and runs his own errands or serves as his neighbor's helper on occasion; or, on the other hand, with a factory equipped with automatic machines under the care of skilled men whose time is charged direct to the cost of product.

Experience gained in connection with the cost accounts of factories and shops covering a wide range of manufactures shows ratios of indirect to direct varying from 20 to 150 per

[1]Presented before the American Society of Mechanical Engineers.

[1]A unit value of $1,000 for land and building and a new cost of $6.620 for equipment are taken as a basis for these estimates.

cent; and even higher percentages would not necessarily be surprising or discreditable to the management. The introduction of scientific management always increases the ratio of indirect to direct expense, and yet decreases gross cost as well as prime or direct cost. In fact, as between a shop under the best methods of 20 years ago and the best modern practice, prime costs afford no possible basis of useful comparison. High indirect and low direct costs are to be expected with modern equipment, even without scientific management. Heavy cuts by a powerful machine tool in charge of an efficient semi-skilled man at usual day wages often involve an operating cost of $1 per hour for the machine (an item of the expense account), against a direct wages cost of 30 cents for the man, a ratio of 330 per cent. Whenever, as in this case, the direct cost is a mere fraction of the expense burden, to keep accurate costs of the labor and material items only is nothing less than absurd.

Effect of Scientific Management

Scientific management, while increasing the ratio of indirect to direct expense, decreases in greater proportion. The net saving cannot therefore be ascertained except by accurate knowledge of the details of each class of expense. This knowledge must be continuous, always at hand for instant use. The works manager cannot wait 12 months for an annual audit to show whether a new planning department has saved its cost, or increased operating expense has been followed by a greater increase in value of output. The engineer who is trying to persuade a superior officer in the financial department to authorize the purchase of newer equipment or the increase of the supervisory force will appreciate the advantages of accounting methods by which the exact results of changes in ways of doing work may be demonstrated through the factory accounts. In every factory, the exact result of each new task - setting operation, change in method, and improvement in equipment, not only in regard to the wages and supplies of today, but also with respect to the operating expense accounts of the month and the fixed charges of the year, should be known in detail and at once. These requirements can be met only by a clear and comprehensive analysis of the true incidence of the fixed charges, and of the indirect details of operating expense, followed by the introduction of methods by which each item of factory product may be charged with that proportion of the indirect expense which corresponds to the cost of maintaining the shop facilities used in performing the manufacturing operations upon that item. The same degree of precision obtained in charging to the cost of work the direct expense for material and labor, should be reached in charging the large and important indirect expense. The part of the engineer in developing the scheme of correct distribution of burden is much more than mere scientific interest in the work of some outside accountant.

Analyze Data and Conditions

The first step in the solution of the problem is to analyze the data and conditions. Of the items which go to make up indirect expense or factory burden, some of them are observed to have a very clear incidence upon definite points within the factory. Consider the annual interest on the value of a factory building. Surely it will not rise with an increase in wages or cost of material; nor with an increase in output; nor does it concern anything which takes place in some other building. The building is there to serve a useful purpose; and whatever benefits by that purpose should pay its share toward the interest of the cost of the building. The purpose is evidently the housing of machines and their operators, each of which machines forms a unit in the productive scheme of the factory. Let the building be divided accordingly (by imaginary lines) into productive units, and require each to earn the interest on that part of the whole building which is occupied by the equipment, operator and work in progress, of the unit.

Annual Fixed and Operating Expense

Once attacked from this point, the problem of a correct distribution of expense burden becomes easy of solution. The first step in the process is to obtain a schedule of annual fixed and operating expense. This includes the reserves for interest and depreciation, taxes, insurance and other fixed charges, a reasonable allowance for the expected average repairs, and the expense for supervision, small tool upkeep and power cost. Each of these charges is to be split up and apportioned among the particular productive units to which it belongs, the total to be carried as an element of the cost of that part of the factory product which passes through that particular productive unit during the year. The incidence of each detail of the burden being clearly on the productive unit, which comprises equipment, accessories and a portion of the building and land, the whole of the annual charge has as direct an incidence on the work passing through the production center in the year as the wages of the operator on the equipment of the center. The labor cost is the amount paid the operator, on day, hour, piece, premium, bonus or whatever system is used. The equipment cost is a suitable fraction of the annual burden. As most of the burden elements (interest, taxes, etc.) have a time factor, it is convenient to reduce the annual charge to an hourly rate, and to make the charges to cost of work on the same time units that are provided by the work records of the operatives.

Practical Application

In the practical application of this fundamentally correct system of apportioning expense burden, several interesting and illuminating conceptions have been brought out. The labor of calculation is reduced by following a standard procedure, commencing with the schedule of expense, Table I. The items belonging to the land are first grouped, and divided by the square feet of occupied land to obtain a land factor in dollars per year per square foot of land. Next, the portion of land belonging to each building is tabulated, and the area of each portion in square feet is multiplied by the land factor to give the total land charge for each building. This forms the first element of burden for the building. The interest, taxes and insurance are calculated on the book value of the building; the annual cost of heat and light are computed and the items totaled to obtain the annual building factor, and divided by the floor area of the building to give the square foot factor. The next step is a map or diagram showing each production center with its working floor space, including in the list of centers erecting floor spaces, benches, and all equipment on which men are employed or operations performed on factory product. The centers are then to be tabulated in order by departments as in Table II, with the appraised value and square feet of floor space occupied by each. Multiplying the latter by the square foot factor, the total building factor of each productive unit is obtained.

Accessory equipment goes with the producing machine of each production

Table II.

DEVELOPMENT OF BURDEN CHARGES.

Equipment Number	No of Machines	Description of Equipment	Equipment Appraisal: New Value Each	Equipment Appraisal: New Value Total	Equipment Appraisal: Life Age	Equipment Appraisal: Life Future	Building Factor: Square Feet	Building Factor: Charge[1]	Power: Estimated H. P. Individual Motor	Power: Estimated running time	Power: H. P. ratio	Power: H. P. hours	Power: Charge	Share of Accessories Value: Motor (on H. P.)	Share of Accessories Value: Small tools and grinders: Ratio	Share of Accessories Value: Small tools and grinders: Charge	Share of Accessories Value: Shafting and Furniture (on sq. ft.)	Present value of equipment	Total value Accessories	Interest, taxes and insurance (on total equipment and accessories)	Depreciation	Repairs: Ratio	Repairs: Charge	Total columns 9-14-21-22 and 24	Foreman and helpers	Total annual burden Cols. 25 and 26
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27
1634	1	Engine lathe, 16 in. x 6 ft., 8 in. chuck..	$350	$ 350	10	10	45	$ 6	2½	2,400	6,000	2,480	$ 29	$ 27	7	$ 25	$ 15	$ 175	$ 67	$ 14	23		19	91	135	226
1635	1	Engine lathe, 13 in. x 5 ft., 6 in. chuck..	300	300	10	10	60	8	2	2,400	4,800	1,990	24	18	7	25	20	150	63	12	20		16	80	135	215
1636	1	Milling machine, 6 in. vise.....	600	600	10	10	138	17	2	2,000	4,000	1,650	20	18	10	36	46	300	100	24	39		33	133	112	245
1637	1	Driller, 10 in., 15 in. swing.....	125	125	20	10	61	8	½	2,400	4,200	493	6	4	5	18	20	42	42	5	8		7	34	135	169
1638	1	Driller, 11 in., 24 in. swing.....	175	175	20	10	77	10	2	2,400	4,800	1,980	23	18	5	18	25	58	61	7	11		10	61	135	196
1639	1	4 Spindle drill.....	200	200	20	10	63	8	1	1,000	1,000	413	5	10	5	18	21	67	49	7	11		42	42	56	98
1640	1	1½ Milling machine.....	530	530	10	10	99	12	2	1,800	3,600	1,480	18	18	10	36	33	265	87	21	34		29	114	102	216
1641	1	Screw press	50	50	10	10	16	2	...	.....	.....	.....	...	...	...	...	5	25	5	1	3		3	9	....	9
1642	1	Shaper, 15 in. stroke, 8 in. vise.....	330	330	10	10	16	2	2	1,800	3,600	1,490	18	18	3	11	5	165	34	12	19		18	69	102	171
1643	1	Milling machine, small.....	350	350	40	5	30	4	¼	1,000	250	103	1	2	6	22	10	29	34	4	12		19	40	56	96
1644	1	No. 1 Universal Grinder.....	250	250	15	10	36	5	2	100	200	83	1	18	4	15	12	100	45	8	14		14	42	6	48
1645	1	Screw machine	550	550	20	10	25	3	2½	500	1,250	501	6	26	7	25	8	183	59	14	23		30	76	28	104
1646	1	Cutter grinder	150	150	20	10	30	4	¼	100	25	10	..	2	3	11	10	50	23	4	7		8	23	6	29
1647	1	Surface grinder	150	150	10	10	30	4	⅛	1,000	375	155	2	4	1	4	10	75	18	6	9		8	29	56	85
1648	1	Surface grinder, small.....	125	125	10	10	20	3	⅛	500	31	13	...	2	1	4	7	63	13	5	8		7	23	28	51
1649	1	Polishing lathe	30	30	20	5	35	4	⅛	500	62	26	...	2	3	11	12	6	25	2	6		2	14	28	42
1651	1	Small forge and equipment.....	40	40	10	10	35	4	¼	750	188	78	1	2	1	4	12	20	18	2	4		2	13	42	55
1653	1	Power hack saw.....	40	40	10	10	35	4	¼	500	125	52	...	2	2	7	12	20	21	2	4		2	12	28	40
1654	1	Speed lathe, 12 in. x 6 ft.....	75	75	10	10	48	6	⅛	300	38	16	...	2	4	15	16	38	33	4	7		4	21	17	38
1655	1	Lathe with collets and turret attachm'ts..	300	300	10	10	66	8	2	1,000	2,000	825	10	18	10	36	22	150	76	13	22		16	69	56	125
1656-1659	4	Rivett bench lathes.....	450	1,800	10	10	92	12	⅛	4,800	600	250	6	9	32	116	31	900	156	64	105		98	285	317	602
		Bench space for two men.....		100	10	10	255	31	...	4,800	.....	.....	...	...	12	43	83	50	126	11	18		5	65	270	335
		Totals.		$6,620			1,312	$165			34,144	14,088	$170	$220	138	$500	$435	$2,931	$1,155	$242	407		361	1,345	1,850	3,195
		Accessories:—																								
1650	1	Wet grinder, 12 in.....	80	80	10	10	34																			
1652	1	Grindstone.	30	30	10	10	61																			
		Shafting, $180; miscl. trucks, etc., $200.																								
		Storage space					62																			
		Total floor area of shop.....		$6,730			1,469																			

Repairs apportioned by judgment, and include small tool repairs.

[1]Value of land and building occupied by shop equipment in column 3, $1,000, interest 5 per cent, depreciation 2½ per cent, tax 1 per cent, insurance ½ per cent $90
Building repairs, estimated at..... 25
Heat $40, Light $10 50

Total building charge..... $165

center, that is, shafting, belts, all or a share of a motor, small tool equipment, and the like. The value of such equipment is generally much less than the value of the principal machine, so that absolute accuracy in apportioning accessories is not essential. If the value is very small, it may be divided among the units in proportion to the value of their producing machines; if large, shafting and belts may be apportioned to the units on the basis of the floor space occupied by each, motors driving groups on the basis of the working horsepower-hours of each productive unit, and small tools by judgment. If the greatest accuracy is desired, the accessories may be treated separately and each one measured, appraised and assigned to the productive units accordingly.

Depreciation Computation

The remaining calculations are carried out for each unit independently, including the value of the accessories with that of the main machine. A depreciation rate is set for each unit, or class of machines, and the corresponding annual charge is computed. Interest on the value of the machine, taxes and insurance are also provided for. All these are definite quantities, not open to argument. There remain certain items not as definite and include power cost, repairs, general labor, factory supplies and in a machine shop, cost of tools, each of which requires special treatment. Power, if it could be metered separately to each productive unit, would become a direct charge; but as this is impracticable, and the power cost is not of the greatest magnitude, a reasonable approximation can be made by estimating the average power consumption, the average running time, and so the average annual horsepower-hours of each unit, and multiplying by the cost of a horsepower-hour to obtain the power factor of the burden charge. Supplies and general labor are best divided by estimate and judgment. Repairs to the individual units cannot possibly be foretold; but the average total repair cost of the plant, or even of the several departments of the plant, can be estimated with some degree of precision, and distributed to the productive units in any of several ways. Perhaps the most practicable is to set by estimate figures representing the probable proportion of repairs likely to be required by each kind of machines, placing one opposite the machine likely to require the least expense for up-keep, two for those machines likely to require twice as much expense, and so on. By adding these figures for a denominator and using each figure separately for a numerator, the total estimate for repairs can be divided up among the several units. There is no advantage for cost-keeping purposes in attempting to charge the actual cost of repairs into the operating expense of each unit. In repairs for lightning and the like, which generally strikes without warning, there is no reason why the expense burden and therefore the cost of work done by one of several similar machines should be temporarily increased merely because that machine suffered breakage and was repaired at this particular time. Standard power and repair costs are a great help in rational cost-keeping, since they minimize fluctuations in cost not due to difference in management. By opening separate repair accounts, charging these accounts with actual cost, with all its momentary variations, and crediting the standard estimates, the varying balances tell an interesting story of the work of the repair gang, and keep the fluctuating costs of repairs from exerting a disturbing influence on the cost of product. A power plant account similarly operated is also very useful.

Tabulation of Expenses

The tabulation now includes subdivisions of all the expenses which go to make up the factory burden, up to the point at which the completed goods leave the factory, but exclusive of the administrative expense. If the total burden chargeable to each unit is divided by the respective annual working hours of the units running full time, an hourly rate for each productive unit will be obtained, which if applied to the cost of the work done by each unit, will in a normal year of full working time accumulate a credit which will balance the shop expense burden. There are, however, many lost hours in the course of the working year and such losses reduce the credit which is to stand against the annual shop burden, and tend to produce a deficit. Short time may be due to any of three causes, each of which gives to the resulting deficit a different significance. In the ordinary operation of a factory, time is lost by the productive units through illness of operatives, changes in the force, breakages and repairs, and lack of capacity in other units. Obviously, a deficit in the credit against burden due to losses of this character is a manufacturing expense, and should be distributed to the cost of work.

Lost working time, however, may be due to sales department conditions, as when machinery is installed for the manufacture of goods which have a seasonable demand, so that they can be sold during only part of the calendar year. A deficit due to lost time of this character is selling expense, and not part of manufacturing cost. In such a case, the sales department undertakes to earn through profit on the sales, the necessary amount to pay for the use of the capital invested in the equipment over the period of idleness. The manufacturing cost cannot be increased merely because consumption ceases after a time, so that the machines have to be stopped. If it costs $1,000 to operate equipment for three months, and another $1,000 for the following three months, it is not to be supposed that it costs $2,000 to operate for the first three months only. Factory product can be made continuously, stocked up during an idle period, and sold at the proper time; if such a course is inadvisable, by reason of tying up capital, or loss of interest on the money represented by stored goods, or risks taken, the expense of intermittent operation falls outside of the manufacturing account. Admittedly, someone must pay the fixed charges for each period of idleness; but the party liable in cases of the kind supposed, is not the works manager, who would be glad to operate continuously, but the selling division of the organization, which must take the consequences of sales conditions. Correct accounting practice will not justify the distribution of selling expense to goods before they are sold; wherefore, manufactured goods should not be placed in stock with a burden allowance which includes selling expense, though it is quite proper to include all other items of burden.

Bad Trade Conditions

The third possibility of the deficit due to lost time is that it is a consequence of bad trade conditions. Lost time of this character is neither manufacturing nor selling expense, but a business loss which should be made up out of the profits of good years. Conservative management accumulates a surplus to give stability to the rate of distribution to the stockholders, by reserving a portion of the earnings of good years to be used in maintaining dividends in times of depression. With correct methods in distributing factory burden, the loss due to short

time operation, usually buried out of sight among other expenses which have no relation to running time, is clearly shown, so that an appropriation may be made from the surplus account to carry the deficit of poor years by the extra earnings of good years.

Annual Burden Divisor

The divisor used on the annual burden of each unit should therefore be less than the full annual shop hours, at least by a suitable allowance for holidays and other lost time. In the case of a large special machine for which there is work only part of the time, the expected working hours only should be used as a divisor, for such a unit, to be profitable, must earn its annual charges in the running time which can be given it. Whenever conditions change so that such a unit can be operated a larger proportion of the time, the hourly charge should be correspondingly reduced.

There remain some items like salaries and office expense, the incidence of which cannot be traced to definite productive units. This class of expenses, however, is incident to the operation of the factory as a whole. The larger productive units, with their greater capital value and heavier operating expense, involve a greater tax on the management and administration than the smaller units. The burden charges belonging to the units provide a very fair measure of the responsibility of the management in connection with each, and serve well as a basis of distribution of the overhead charges. It is proper, therefore, to express the overhead expense total as a percentage of the total burden distributed to all the productive centers together, and to raise the hourly rate of each unit by the same percentage. Thus, if $100,000 is distributed to centers, and there is an undistributed overhead of $10,000, the rates can be raised 10 per cent, which will provide for carrying the whole $110,000.

Total Operating Cost

Each productive unit of the factory is thus valued at an hourly rate which is to be charged in the cost of each operation performed by the unit. The total cost of an operation accordingly consists of a labor charge and an equipment charge. The basis of each machine rate is a careful investigation of the operating costs of the particular machine, so that the rates set are in accordance with the facts in each case. Whatever fluctuations there may be in operating expense are likely to balance each other above and below the calculated charges. But as there will be some variation in any event, it is permissible to obtain the advantage of easy calculation by equalizing the machine rates into two, three or more round figures, each covering productive units whose exact rates fall near together. On the job tickets by which the time or piece price of the labor is computed, a space should be provided for the burden figure, so that the completed job tickets will give both elements of the cost. Any change in methods or men will now indicate its complete result by a comparison of the job tickets for the same work done under former and present conditions.

Accounting Details

The accounting detail of the expense burden distribution is simple and effective. A burden distribution account is opened, to which is charged the calculated amounts of Table I. The account is credited with the total of burden charges to cost of work, by weekly or monthly periods. The balance indicates the loss by failure to utilize the full capacity of the factory; while a credit balance, if one should occur, indicates a condition of unexpectedly good management, or good luck, by which the factory has worked to better advantage than was believed probable. A standardizing account of this kind is very useful to the management. All the variable expense accounts can, if desired, be handled as suggested for power and repairs, so that uniform credits offset the varying debits, and the balances afford gages for the efficiency of the control of the departments originating the accounts.

A constantly increasing balance in one of the expense accounts will occur if there has been a permanent change in policy with respect to this item. In such a case, it will be necessary to change the equipment rates affected by this change. While it is not at all difficult to go over a column of the tabulation and revise the figures, it will generally be sufficient to change the rates by proportion, enough to absorb the difference. But it is not necessary to distribute all the burden by machine rates. The overhead of salaries and office expense, the cost of storage and handling, and, if desired, any small difference in burden, actual and distributed, may be distributed as a rate per pound on a homogeneous product, or as a rate per order if orders are all of the same size, or as a percentage of gross cost, if that seems the most reasonable method. In every factory, careful analysis of the facts will point out the true incidence of expense due to factory operation, or factory product as a whole, rather than individual production centers.

Stability in Cost of Manufacture

A valuable result of localizing variations in expense burden is stability in the cost of the manufactured product. Because a repair force is discharged to save expense, and everything is allowed to fall into bad order, is no reason why the cost of goods made during the period should appear to decrease. The management is in effect borrowing part of the cost from the stored energy of the organization, or discounting the future. All fluctuations not directly due to a change in manufacturing methods are objectionable if carried into cost of product. Where the cost of similar articles varies uncertainly from day to day, each fluctuation is likely to have a different cause, much time is taken in searching for the causes, and incorrect conclusions are often drawn, or it is assumed that some unknown and unusual condition is responsible, and the attempt to trace the cause is given up. Increased labor cost is easily discernible and can be traced directly to its origin. Variations of material cost are quite as easy to explain; but where burden charges vary with labor charges, under the old percentage or hourly rate methods, a change in cost of labor involves a totally unrelated change in the burden charge, and no clear conclusion can be drawn.

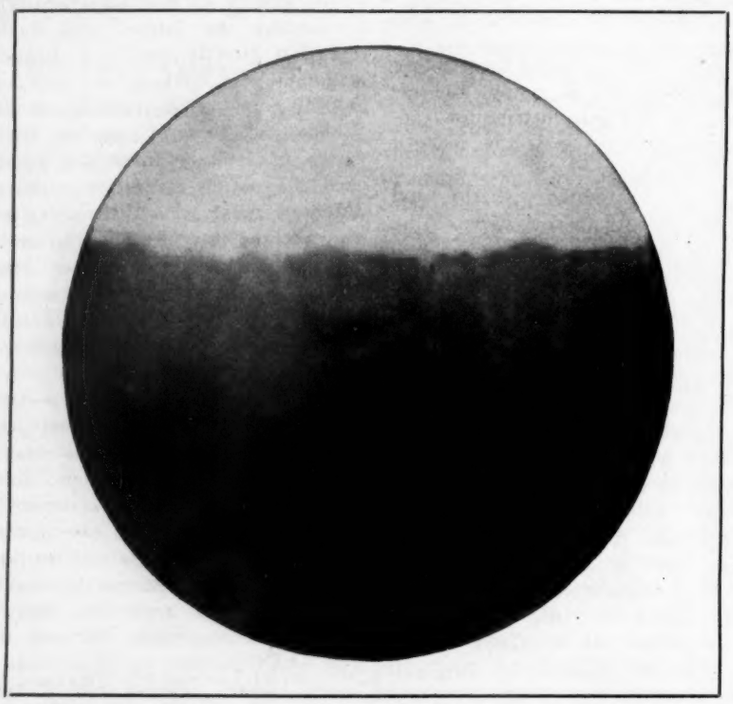
Exact Calculations Necessary

Exact calculations are at the base of all well-planned engineering work. Exact uniform methods of cost calculation should be at the base of all factory accounting systems. Wherever associations of manufacturers operating on similar work have investigated the cost-keeping methods of the various factories, the investigators have been surprised to note the wide variation between the apparent or book cost of the same products, made under the same conditions, but figured in different ways. The inevitable result is that some factories bid for work below cost, and thereby injure the business chances of all. The remedy is not the maintenance of unduly high prices by agreement, thereby inviting competition from every outside shop; but an exact analysis and apportion-

ment of the expense burden in such a way that each item of factory work will be properly charged for the use of that portion of the shop equipment and facilities which is devoted to it, and the true margin of profit between cost and selling price will be clearly apparent.

The Lohmannizing Process

The Lohmannizing process of coating iron and steel consists essentially of the application of a protective alloy which permeates and becomes an actual part of the treated metal. Micro-photographs of cross-sections of Lohmannized sheet shows a gradual shading from the original alloy to the base metal, indicating a deep permeation of the treated material by the protective alloy. The micro-photograph shown in the accompanying illustration represents a magnification of 65 diameters and the long slender tentacles which have penetrated into the base metal, filling up cavities of even the most minute character, are clearly illustrated. If the thin alloy coating on Lohmannized material is ruptured, the sheet is still protected by the deep-seated alloy which permeates the treated metal, and this alloy cannot be fractured in ordinary use without breaking the sheet itself.



MICRO-PHOTOGRAPH OF A CROSS-SECTION OF A LOHMANNIZED SHEET, SHOWING THE PERMEATION OF THE BASE METAL BY ALLOYS; MAGNIFICATION, 65 DIAMETERS

The object to be treated by the Lohmannizing process is first pickled in a sulphuric acid bath to remove rust, scale, dirt, etc., and it is thus prepared for the Lohmann bath, which is composed of acid and amalgamating salt. This further cleanses the pores and cavities and deposits a metallic salt upon the entire surface which penetrates into the most minute pores and cavities. After the Lohmann bath, the treated metal is dried and is then immersed in a molten alloy. An amalgam or chemical union is thus formed between the amalgamating salt and the protective alloy. The temperature of the treated metal is increased gradually by the molten alloy which has a temperature of 950 to 1,000 degrees Fahr. When the metal reaches a temperature of 500 degrees Fahr. the amalgamating element volatilizes and escapes from the surface of the alloy. In its passage to the atmosphere, the evaporated amalgamating salt frees the surface of the metal, including the pores and cavities, from all oxidizing agents. The salt, in evaporating, leaves the base surface absolutely clean and the alloy adheres thereto, filling the most minute pores and cavities. As the oxygen contained in the pores and cavities, as well as on the surface of the metal has a greater affinity for the amalgamating element than for either the base metal or the alloy, it passes to the atmosphere, thus taking from the bath the minimum natural oxidizing agent. The frequent cause of failure in other protective coatings can generally be traced to the presence of oxygen in some form between the treated metal and the protective coating. The amalgamating element, upon evaporation, carries with it all of the acid or gaseous adulteration and nothing remains to prevent the absolute blending of the alloy with the sheet. The Lohmann coating is non-porous and, therefore, no part of the base metal can be exposed to corrosive action unless the sheet itself is broken.

The Brier Hill Steel Co., Youngstown, licensee of the Lohmannizing process, after a long series of experiments, has perfected this method of amalgamating a protective alloy with iron and steel sheets.

Preheating the Blast

To the Editor:—

I have been much interested in reading the article in THE IRON TRADE REVIEW of Feb. 22, 1912, on an improved German hot blast stove and an iron heater in which it is proposed to preheat the cold air used for combustion. I enclose herewith copy of a patent taken out by me in 1896, embodying the same idea. There is no question, but what a large saving is possible over existing practice, by the use of this idea both in hot blast stoves for blast furnaces as well as regenerative furnaces of all kinds.

S. T. WELLMAN, Cleveland.

The patent issued to Mr. Wellman on April 7, 1896, covered the heating of the volumes of air employed in regenerative gas furnaces before the air entered the regenerators and for the purpose of heating this air, the products of combustion which had previously been passed through the regenerators were employed. The claims allowed Mr. Wellman follow:

1.—The mode herein described of operating a regenerative gas furnace, said mode consisting in raising the temperature of the air before it enters its heat-distributing regenerator, to a high degree of heat approximating that of the gas entering its heat-distributing regenerator, and employing for the purpose of thus heating the air, the products of combustion escaping from the heat-absorbing regenerators.

2.—The combination of a regenerative gas furnace having two pairs of gas and air regenerators, constructed for use alternately as absorbers and distributers of heat, and a single regenerator acting as a continuous absorber of heat directly from the products of combustion on their way to the chimney, and a continuous distributor of a high degree of heat to the air supply on its way to the regenerator, approximating that of the gas entering its heat-distributing regenerator.

The Panama Canal and the United States Export Trade

By R D Williams

To the south of the United States lies one of the greatest natural markets of the world. Its foreign trade amounts annually to $2,000,000,000. The tables accompanying this article will show how little of it comes to the United States. In a little more than a year the Panama canal will be opened, which will make the west coast of Central and South America more accessible to all nations, with a great advantage to the United States. It must be stated right here that the foreign nations are far more active in preparing to take advantage of this canal than is the United States. The activity abroad is unprecedented in the history of the ocean-carrying industry. English periodicals are already declaring that the piercing of the Isthmus will revolutionize the world's trade routes. The Panama canal will shorten the distance between Europe and San Francisco by 6,200 miles; between Europe and Valparaiso, 2,100 miles; between England and Australia, 800 miles, and between England and New Zealand, 1,600 miles. For months the foreign steamship lines which are directly concerned with traffic in the canal zone, have had their representatives on a tour of Pacific coast ports. Several of the north Atlantic steamship companies are credited with the intention of making use of the canal for the purpose of exploiting the resources of the Pacific slope as a field for emigration. An agent of the Cunard Line recently visited San Pedro, Tacoma, Seattle, Portland, Vancouver and other points on the Pacific coast. The French Trans-Atlantic Line is organizing a service line between Havre and San Francisco and the Danish-East Asiatic Co. a service from Copenhagen to the Pacific coast. The North German Lloyd is contemplating the transportation of emigrants from European ports at the same rates which are now charged from New York, plus only the Panama tolls.

Table I.

United States exports to:—	
Costa Rica	$ 3,031,369
Guatemala	1,959,246
Honduras	1,579,208
Nicaragua	1,653,553
Panama	20,489,503
Salvador	1,309,744
Mexico	58,193,704
British West Indies	11,157,308
Cuba	51,794,848
Danish West Indies	746,286
Dutch West Indies	653,801
French West Indies	1,281,911
Haiti	4,381,513
Santo Domingo	3,030,520
Argentina	40,364,342
Bolivia	603,731
Brazil	22,764,183
Chile	8,293,312
Columbia	3,889,079
Ecuador	2,213,907
British Guiana	1,842,733
Dutch Guiana	683,230
French Guiana	298,803
Paraguay	61,142
Peru	4,536,126
Uruguay	4,227,566
Venezuela	2,745,932
Total	$253,786,590

Greater Stability to Home Market

There is no question in our minds but that the development of a substantial export business by the steel industries of the United States would result in giving much greater stability to the home situation.

George M. Verity,
President, American Rolling Mill Co., Middletown, O.

Canal Monopolized by Foreign Ships

Unless there is an immediate awakening to the situation the foreign steamship companies will monopolize trade through this waterway. It is true that some of the American companies are preparing for it, but there is no such movement as that which marks the foreign steamship companies. The Pacific Mail Steamship Co. will probably add to its equipment, as it has formulated plans for four large liners for service between New York, Los Angeles and the Orient. These ships, while not as large as the great White Star liners, will nevertheless be larger than anything on the Pacific, being about 680 feet over all. The A. H. Bull Steamship Co. is also adding to its equipment. In fact, this company seems to have exhibited a little more foresight than the rest as it has ordered five steamers during the past three years. The American-Hawaiian Steamship Co. is also building five. The Red Star Line has transferred two of its American-built ships from the Belgian flag to American register in order to take advantage of the new port-to-port trade which will undoubtedly develop.

And this leads us to the crux of the whole matter. Are American ships to pass through this canal free? If they are not, wherein lies the American advantage in building the canal? It is admitted that an American ship cannot operate as cheaply as a foreign ship. The wage and food scale of the American ship is such that it cannot possible operate as cheaply as a ship of foreign register. That is a condition, not a theory, and it cannot be overcome by merely blinking at it. The Panama canal should be free to the American ship both in coastwise and foreign trade. A number of nations rebate the Suez toll to the ships of their register that pay

Table II.

United States imports from:—	
Costa Rica	$ 3,641,298
Guatemala	1,959,246
Honduras	2,012,225
Nicaragua	1,321,767
Panama	2,229,189
Salvador	1,176,393
Mexico	58,795,943
British West Indies	11,154,683
Cuba	122,528,027
Danish West Indies	403,926
Dutch West Indies	658,146
French West Indies	43,232
Haiti	790,579
Santo Domingo	2,462.716
Argentina	33,463,264
Bolivia	189
Brazil	108,154,491
Chile	20,921,326
Colombia	7,485,141
Ecuador	2,215,951
British Guiana	567,793
Dutch Guiana	925,782
French Guiana	300,273
Paraguay	29,170
Peru	7,621.497
Uruguay	7,413,896
Venezuela	6,701,352
Total	$404,977,505

them, and as for the British ship, the British government owns the Suez canal and gets the revenue.

Whenever it is necessary to do something to protect our interests it will usually be found that there is some treaty or other forbidding it. When it comes to the making of treaties American statesmen do not appear to have exhibited the far-sightedness of the statesmen of other nations. Our statesmen appear to be bent upon exchanging American rights for considerations of a very doubtful character. Now if European nations rebate to their vessels the toll charges of the Suez canal, when the construction of the canal cost those nations not a single penny, what is the equitable thing to do with a canal, the sole cost of which was borne by the American people? It is certainly a most unbusiness-like proceeding if the American people are to derive no advantage from it.

Congress did a mighty wise thing when it removed the coastwise trade from the jurisdiction of the treaty-makers and confined it exclusively to the American ship. Were our port-to-port trade open to treaty considerations, foreign ships would have monopolized it long ago. Our plain duty to the American ship is to make the Panama canal free to it. The Monroe doctrine prevents political interference from European countries in the affairs of the countries of our southern hemisphere. A fine field for American statesmanship would be the promulgation of a commercial Monroe doctrine. When the Panama canal is opened an evitable revolution in the domestic affairs of Mexico and the Central Americas will follow. The not too distant future will see the Caribbean Sea and the Gulf of Mexico bordered with prosperous cities and under wise, reciprocal legislation, an interchange of commerce between the United States and these countries might be developed.

It is impossible to forecast the extent of the new world that this waterway will create. The most vaulting imagination may fall far short of the reality. The point is to conserve it as much as possible for the American manufacturer and the American ship. Other countries, notably Germany, would never let this business escape.

As it is at present, we are getting a very small share of the trade, notwithstanding our proximity, as the tables accompanying this article will show. All things being equal, the South American peoples would naturally rather trade with us than with foreign countries, because as occupants of the same hemisphere our interests are more in common. No end of testimony could be submitted to show how persistently foreign countries have developed the great native fields of South America and how negligent the United States has been. *Trade follows the flag.* It is only necessary to point to the preponderance of British and German trade with South America to prove that. It is eternally necessary for the development of American commerce with the southern part of this hemisphere that the ship should fly the American flag and be operated in the interests of the American manufacturer. Patriotism in this particular is not a matter of sentiment, but of dollars and cents.

Germany's Foreign Policy

The nation to be reckoned with in the race for commercial supremacy in the foreign field is Germany. If the United States desires to compete with Germany in this field it will have to undergo a complete reorganization of its foreign policy. It will have to have a department on foreign affairs with efficient consular service keeping closely in touch with the intimate wants of the world and reflecting them through chambers of commerce and other trade organizations to every manufacturer. The railways too will have to come into the general scheme of action through preferential rates that will enable the manufacturer to land his product at seaboard at such cost that he may successfully compete with foreign nations pursuing the same policy.

The most important government function in Germany is the foreign office and in constructive policies for the extension of trade they are far and away ahead of this country. Of course, there is a reason for it. Foreign trade is their life blood today. It is more necessary to their continued existence than it is to that of the United States with its enormous home market and that is the reason why the United States should work harder to maintain its just share.

Territorial Trade Expansion

The Germans are a peace-loving people. They keep a large standing army bristling on their frontiers, not because they want to, but because they have to. The Germans have not territorial aggrandizement in mind, they have territorial trade expansion in mind. They are not colonists. When they emigrate, the country to which they emigrate absorbs them, and they become the most law-abiding citizens. They either lack or refuse to exercise that talent for administering the affairs of other peoples which is so distinguishing a trait of the English people. There are 200,000 Germans in Brazil alone. They are not interfering with the political life of Brazil, but Germany nevertheless is getting a very large part of its foreign trade.

The secret of Germany's success in the foreign field is in part due to the fact that it gives the foreigner what he wants. Its trade is not conducted along the lines of uplift. If the foreigner wants a cheap machine tool they do not seek to educate him to the advantages of a high grade tool. They sell him the cheap tool. Giving a customer what he wants and the way he wants it goes a long ways towards promoting trade. It is the unison with which all the parts of German industrial life work to a common end that has made its foreign trade grow so amazingly. The German manufacturer has only to make the product. The railways and steamship lines acting in conjunction will give him a special rate and the bank as the financial link to the chain will collect payment.

In the short space of 10 years Germany has been enabled to create a fleet of steamers trading largely to eastern countries that are far superior to any British vessels covering the same territory. The industrial development of Germany is certainly astonishing. Twelve years ago France produced more locomotives than Germany. Today a single German firm produces more locomotives than the whole of France. Science and industry are hand-maidens in Germany more so than in any other country with the result that many new and better combinations of materials have been produced. A few years ago England invaded Germany with its chemical compounds; today the situation is reversed and the English are buying very freely of German products. There is something of a hub-bub in England about this situation, but it follows a natural law and cannot be stopped. The German goods are doubtless quite satisfactory and probably cheaper.

As a consumer of American products Germany offers a decreasing market. There are two reasons for this condition. The first is that American exports of foodstuffs are growing less owing to the increased consumption at home and the second is that Germany is making in greater proportion the manufactured products that we for-

merly sent to her. Our export trade to Germany amounted to $305,000,000 in 1908, and fell to $282,000,000 in 1910, a decrease of 8 per cent. Germany sold to us $104,000,000 worth in 1908, and $150,000,000 worth in 1910, an increase of nearly 50 per cent. The actual percentage is really greater because practically all of our imports from Germany represented values of which labor was the greatest part. The great bulk of American exports to Germany were in raw material in which labor represented a small part. The time when Germany will surpass Great Britain as an exporter of this world's goods is a matter of mathematical calculation only. She is gaining by perceptible percentages annually.

Constructive Statesmanship

Now what has brought this about? Nothing in the world except constructive statesmanship of the most enlightened character—the deepening of harbors, the creation of a system of waterways and railroads so wisely controlled by the nation as to make them serve the people and not the people serve them, making the entire system of internal transportation contributory to an ocean system and thereby creating a merchant marine to reach and develop foreign markets and thus keep her own people at home with the promise and fulfillment of constant employment. The policy has worked. Ten years ago 400,000 artisans annually left Germany. Today the number is less than 40,000. German emigration is becoming a negligible quantity. With a 40 per cent increase in population in the past 30 years, Germany has increased her foreign trade by 100 per cent per capita. In the same period the United States has increased her foreign trade only 15 per cent per capita.

About 90 per cent of the total iron output of France is derived from the iron ore beds of Meurthe-et-Moselle, which cover about 208 square miles, the ore being of the same quality as that mined in German territory. The ore contains approximately 32 per cent of iron and consists of an oolitic limestone, with the exception of two of the beds, which are strongly siliceous. The ore is high in phosphorus and before the invention of the basic steel-making process, was not developed to any great extent. The mines can be operated cheaply by tunnels driven in from the slope of the plateau.

New Catalogs

AUTOMATIC TIME SWITCHES.—A bulletin issued by the General Electric Co., Schenectady, N. Y., is devoted to two types of automatic time switches for alternating and direct current circuits. The bulletin contains the usual diagrams and dimensions.

DIRECT CURRENT EXCITER PANELS.—A bulletin issued by the General Electric Co., Schenectady, N. Y., illustrates and describes a line of direct current exciter panels for use in connection with alternating current generator panels when, for any reason, separate control of exciters is desired. The present bulletin supersedes a previous publication on this subject.

ALTERNATING CURRENT SWITCHBOARD PANELS.—In a recently issued bulletin, the General Electric Co., Schenectady, N. Y., illustrates and describes a type of alternating current switchboard panel with oil switches attached. It is designed for three-phase, three-wire circuits, and for 240, 480 and 600 volts and 25 to 60 cycles. This bulletin supersedes the company's previous publication on this subject.

INDICES, ERRATA SHEETS, ETC.—The Fort Wayne Electric Works of the General Electric Co., Fort Wayne, Ind., has issued a revised index of its various bulletins, including Nos. 1001 to 1141. An index has also been issued, which classifies the various subjects treated in its instruction books, Nos. 3001 to 3052, inclusive. Errata sheets, recently issued, contain corrections for bulletins Nos. 1127 and 1128.

SHEET METAL WORKING MACHINERY.—The Dreis & Krump Mfg. Co., Chicago, in catalog No. 12, lists a widely diversified line of motor-driven, belt-driven and hand power metal working machinery, which includes bending brakes of all descriptions. Particular attention is directed by the manufacturer to the all-steel construction of these machines and to the numerous sizes in which they are obtainable.

GAS, GASOLINE, OIL AND PRODUCER GAS ENGINES.—The International Gas Engine Co., Cudahy, Wis., has issued a new catalog devoted to its line of high grade gas, gasoline, oil and producer gas engines, ranging in size from the smallest type of farm engine to high powered engines for large power plants. The book is handsomely illustrated and contains complete data regarding the construction and operation of these engines.

STEAM TURBINES.—The Terry Steam Turbine Co., Hartford, Conn., has issued an illustrated folder devoted to its line of steam turbines, turbo-pumps and blowers, etc. Numerous engravings show installations of these machines as adapted to various kinds of service. The folder places the number of Terry turbines now in use at 1,000, these being distributed among power plants, gas works, in mines, on United States war vessels and in general manufacturing establishments.

CONCRETING IN COLD WEATHER.—A booklet entitled, "Concreting in Cold Weather," recently issued by the information bureau of the Universal Portland Cement Co., Chicago, contains complete suggestions and instructions concerning the correct methods of handling concrete in cold weather, such as lowering the freezing point of the concrete by the application of salt, the economical heating of the materials by means of steam and other media, the proper allowance to be made for the heat generated during the hardening process, etc. The booklet also contains a list of valuable hints to inspectors.

PUMPING ENGINE.—In a recently issued bulletin, Henry R. Worthington, 115 Broadway, New York, describes a 10,000,000-gallon, high duty, triple-expansion, pumping engine of the Worthington type, as installed at the Hope station of the Providence, R. I., water works. This pump was erected in the spring of 1910 and put into service in the summer of that year and has been in daily operation since that time. The bulletin contains numerous illustrations and diagrams and an account of the duty trials and other data concerning this pump.

MARINE ENGINES AND EQUIPMENT.—A handsomely illustrated catalog on marine engines and equipment has just been issued by the Ferro Machine & Foundry Co., Cleveland. The book includes complete information on the various problems encountered in the design and operation of gasoline engines for marine purposes, this being collected under such separate headings as "How a Marine Gasoline Engine Operates", "The Carburetor", etc. The data is presented in a simple and easy style and should prove instructive to those interested in the subject.

GAS PRODUCERS. — A 34-page booklet devoted to the general principles involved in the manufacture of gas by gas producers, and especially to the Amsler producer and its accessories, has been issued by Walter O. Amsler, Pittsburgh. Commencing with a definition of the gas producer, and of producer gas, the booklet very thoroughly discusses all phases of the subject, such as the working and cost of operation of producer plants; the relative cost of fuels; flue design, etc. The treatise is strictly up-to-date and includes much valuable information which has not previously been published.

BALL BEARINGS.—The New Departure Mfg. Co., Bristol, Conn., has issued an engineering edition of its catalog on ball bearings. These bearings are of the following types: Double-row, or combined radial and thrust bearing, having two rows of balls and sustaining loads from any angle; single row, or strictly radial, bearing, having one row of balls and taking only a slight thrust; radax type, taking radial loads and thrust in one direction. All these bearings are made in international standard sizes with reference to bore and diameter. The catalog includes full data as to the manufacture and use of ball bearings.

DIRECT CURRENT MOTORS.—A bulletin recently issued by the Fort Wayne Electric Works of the General Electric Co., Fort Wayne, Ind., outlines some important changes which have been made in its line of direct current motors. These motors embrace the following general classes: Horizontal, continuous duty, constant speed; vertical, continuous duty, constant speed; horizontal elevator motors, constant speed, two hour, one-hour and ½-hour duty; horizontal, adjustable speed, continuous duty; vertical, adjustable speed, continuous duty; horizontal, adjustable speed, intermittent duty on a two-hour basis, and horizontal, adjustable speed, elevator motors. The voltages which have been adopted as standard are 115, 230 and 550. The speeds are approximately full-load, 60-cycle, induction motor speeds. It is claimed that, as a result of the adoption of these standards, no such troublesome details as the changing of pulleys are encountered when changing from alternating current to direct current motors. In the vertical motors of this line, a new type of thrust and steady bearing has been developed. The bulletin contains the usual illustrations and diagrams.

EXTENSIVE USE

Of Oil in Place of Coal—Canadian Production.

Toronto, March 10.—The fourteenth annual convention of the Canadian Mining Institute was held at the King Edward hotel last week. There was a large attendance from all parts of Canada, and a number of prominent American mining men were present. Dr. Frank D. Adams, of McGill University, Montreal, the president, occupied the chair. President Adams, in his annual address, congratulated the members on the continued prosperity of the mining industry. The total output for last year showed a slight decrease, but that was due to the protracted coal strike in the west, which also affected the copper smelters, causing a falling off in British Columbia's output amounting in value to $4,500,000.

John McLeish, of the Canadian department of mines, presented a preliminary report of the mineral production of Canada for 1911, showing a total metallic output of the value of $46,197,428; and non-metallic, $56,094,258, being a total of $102,291,686, as against metallic, $49,438,873; non-metallic, $57,384,750; total, $106,823,623, for 1910. The production of the leading metals was as follows: Copper, 55,848,665 pounds, value $6,911,831; gold, $9,762,096; pig iron, 917,535 tons, $12,306,860; lead, 23,525,050 pounds, $818,672; nickel, 34,098,744 pounds, $10,229,623; silver, 32,740,748 ounces, $17,452,128. All these items show a decrease except pig iron, the output of which increased in value $1,061,238. The production of pig iron by provinces was as follows: For 1911, Nova Scotia, 390,242 tons, value $4,682,904; Quebec, 658 tons, value $17,282; Ontario, 526,635 tons, value $7,606,674; total, 917,535 tons of value of $12,306,860. Of the total output in 1911, 20,758 tons were made with charcoal as fuel and 896,777 tons with coke. The classification was: Bessemer, 208,626 tons; basic, 464,220 tons; foundry and miscellaneous, 244,686 tons. The amount of Canadian ore used was 67,434 tons; imported ore, 1,628,368 tons; mill cinder, etc., 30,298 tons. The total daily capacity of 18 completed furnaces was 3,630 tons, and the number of furnaces in blast Dec. 31 was 12. The total shipments of iron ore are reported as 210,344 tons, valued at $522,319, as against 259,418 tons in 1910. The shipments from the Wabana, Newfoundland, mines by the two Canadian companies operating there were 1,181,463 tons, of which 765,184 were shipped to Sydney, N. S., and the balance to the United States and Europe. Exports of pig iron were 5,870 tons, valued at $271,968, an average of $46.33 per ton. There were imported 208,487 tons of pig iron valued at $2,610,989, and 17,226 tons of ferro-manganese, etc., valued at $429,465. The production of steel ingots was 861,493 tons, and of steel castings, 14,722 tons, as compared with steel ingots, 803,600 tons, and steel castings, 18,684 tons, in 1910. The long-continued strike in southern Alberta and eastern British Columbia caused a considerable falling off in coal production. The total output was 11,291,553 tons, valued at $26,378,477, as against 12,909,152 tons, of the value of $30,909,779, a decrease of 12.53 per cent. Nova Scotia's production showed an increase of 562,978 tons. Exports of coal decreased from 2,377,049 tons to 1,500,639 tons, and imports increased from 9,872,924 to 14,558,892 tons. The total coke output was 847,402 tons, valued at $2,340,674, as against 902,715 tons, valued at $3,462,872, in 1910. The quantity of cement made during the year was 5,677,539 barrels, as compared with 4,396,282 barrels in 1910, an increase of 29 per cent.

Noteworthy points brought out in papers read and the general discussion which followed were the changes in the situation brought about by the substitution of oil as a fuel for steamships in place of coal, and the increase in the production of cheap coal in Japan. It was stated that coal could be delivered at the dock from one mine at $1 per ton so that steamers could obtain a supply there at less than one-half what it would cost in San Francisco.

E. W. Parker, Washington, D. C., said that the use of oil for fuel had displaced approximately 15,000,000 tons of coal. Some of the Japanese steamers used oil on their westward trip, burning cheap Japanese coal on their return trip.

Will Probably Build Plant in Spring

The recently incorporated Goby Engine Co., Cleveland, advises that it will manufacture the Goby sliding valve engine for manufacturers of motor cars, and possibly will license several companies to build these engines under patents owned by the Goby company. Several thousand orders have been received from companies desiring to adopt the motor.

The company, at present occupying the building on Clarkwood road formerly used by the American Ball Bearing Co., expects to build a large plant in the spring. Considerable machine tool equipment will be required by the company, whose general manager is Christian Girl.

PREPARE FOR WORK

Pennsylvania Commission Will Meet in Next Ten Days.

Harrisburg, Pa., March 5.—The new state commission to frame a compensation act for Pennsylvania that will embody the best features of such laws in the United States and in Europe, has been called to meet in Philadelphia within the next ten days to outline the preliminary work. The commission is composed of three lawyers, who are experts in laws governing damages, the chairman being David A. Reed, of Pittsburgh, two employers and two employes, both steel workers and miners being represented.

The commission is to present its report to Governor Tener by Nov. 1, and the adoption of an act that will be fair to both sides is to be strongly advocated in the governor's message to the legislature which will meet here Jan. 7, 1913.

The commission will digest laws of New Jersey, Massachusetts, Ohio and other states dealing with employers' liability and then take up features of those of Great Britain, Germany and France. Early in April a series of visits will be paid to industrial establishments and hearings held in Philadelphia, Pittsburgh, Erie, Scranton, Harrisburg, Johnstown, Wilkes Barre and other centers of industrial activity at which suggestions will be received.

American Institute of Metals

At a recent meeting of the executive committee of the American Brass Founders' Association, it was decided to submit for the approval of the membership, a change in the name of the organization. The American Institute of Metals is preferred to the present name, which does not adequately describe the scope of the association. Another change in the constitution has been recommended which will permit of holding the conventions at a time and place to be selected by the executive committee. The constitution at present provides that the association shall meet each year in convention at the time and place that the annual meeting of the American Foundrymen's Association is held. While it is not the intention to hold the annual meetings of the association at a different time, the executive committee did not consider it wise to have the association bound by a constitutional provision covering the annual meeting.

IRON AND STEEL SECURITIES

The trend of security prices on the New York stock exchange last week was generally upward, the improvement extending from United States Steel and Union Pacific shares to the remainder of the list. Trading was also characterized by greater activity than in the past few weeks.

Monday, foreign brokers sold between 25,000 and 30,000 shares of American securities, principally United States Steel; stocks at home were fairly active and closed firm and higher; grain markets were lower. Tuesday, stocks were active and advanced to the highest level of the movement; cotton was strong and higher; foreign markets were firmer. Wednesday, the market was inactive and reactionary, prices averaging slightly lower; cotton closed lower and wheat higher; gold to the amount of $2,500,000 was engaged for export to Paris. Thursday, stocks were active and buoyant; the Pennsylvania railroad disposed of $10,000,000 worth of 4 per cent bonds; cotton closed higher and grain lower; additional gold to the amount of $1,500,000 was engaged for shipment to Paris; foreign markets were unsettled. Friday, stocks advanced to the highest average on the movement and then reacted. Saturday, the markets were dull but firm; foreign markets were heavy; the coal situation abroad remained unchanged.

Money on call ranged between 2½ and 2 per cent. Time money was obtainable, but without concessions on the part of lenders; the demand, however, was not active. The actual condition of clearing house institutions showed loans increased $19,871,000; net deposits increased $6,804,000; total reserve $449,460,000, and the excess of reserve $16,376,800, a decrease of $6,433,500. Non-member banks and trust companies showed loans increased $1,724,500; net deposits decreased $1,244,100; reserve on deposits increased $1,204,600, and the percentage of reserve 19.7, against 19.6 the week previous. Fortnightly railroad statistics showed a decline in the number of idle cars of 6,116, leaving a total of 7,842 cars idle on Feb. 28. Bank clearings showed a decrease of 1.8 per cent from the week previous, but an increase of 10.5 per cent over the corresponding week a year ago. Commercial failures numbered 344, compared with 366 the preceding week and 252 the corresponding week last year. Shares were sold to the number of 2,601,000, compared with 1,772,460 the preceding week and 1,080,725 the corresponding week last year. Bonds, exclusive of government bonds, were sold to the amount of $12,911,000, compared with $11,791,000 the preceding week and $19,342,000 the corresponding week last year.

	Clos'g Quo. Mar. 9	Changes in week.	Annual Meeting date 1912	Stock Outstanding	Basis.	Dividend Last Dividend	Dividend Date Last Div. Pay
Allis-Chalmers	⅝	— ¼		$19,820,000		.....	
Allis-Chalmers, pr	5	+1		16,050,000	7 cum.	1¼ Q.	Feb. 1904
American Can	13⅛	+1	Feb. 6	41,233,300		.....	
American Can, pr	95¼	+2⅝		41,233,300	7 cum.	1¼ Q.	Apr., 1912
Am. Car & Fdy	55⅛	+2⅛	June 27	30,000,000	2	½ Q.	Apr., 1912
Am. Car & Fdy., pr	117⅞	+2		30,000,000	7 n. c.	1¾ Q.	Apr., 1912
American Loc	36½	+3¼	Oct. 15	25,000,000	5	1¼ Q.	Aug., 1908
American Loc., pr	105⅝	.....		25,000,000	7 cum.	1¾ Q.	Jan., 1912
American Ship	50	.....	Oct. 9	7,600,000	4	2 Q.**	June, 1911
American Ship, pr	102	.....		7,900,000	7 n. c.	1¾ Q.	Jan., 1912
Am. Steel Foundries	29¾	+1¾	Mar. 21	17,184,000	5	1¼ Q.	May, 1911
Barney & Smith	15	.....	June 4	2,000,300	4	1 Q.	Dec., 1907
Barney & Smith, pr	85	.....		2,500,000	8 cum.	2 Q.	Dec., 1911
Bethlehem Steel	30¼	+ ⅜	April 2	14,862,000		.....	
Bethlehem Steel, pr	59⅞	.....		14,908,000	7 n. c.	¾ Q.	Feb., 1907
Cambria Steel	41½	— ¼	Mar. 19	45,000,000*	5	1¼ Q.	Feb., 1912
Cambria Iron	45	.....		8,468,000*	4	2 S. A.	Apr., 1912
Chicago Pneumatic Tool	45	—1¾	Feb. 19	6,448,800	4	1 Q.	Jan., 1912
Colorado Fuel	25	—1	Oct. 21	34,235,500		1¾ Q.	April, 1902
Crucible Steel	11	+ ½	Nov. 15	24,578,400		.....	
Crucible Steel, pr	82¼	+1		25,000,000	7 cum.	1¾ Q.	Dec., 1911
Empire Steel	10	.....	Feb. 28	1,254,770		.....	
Empire Steel, pr	36	.....		2,500,000	6 cum.	2 S. A.	July, 1911
Fay & Egan	70	.....	Feb. 20	1,000,000	7	1¾ Q.	Nov., 1908
Fay & Egan, pr	110	.....		1,000,300	7 cum.	1¾ Q.	Feb., 1912
General Electric	164	+1⅞	May 14	77,281,200	8	2 Q.	Apr., 1912
Harbison-Walker	40	.....	Jan. 15	18,000,000	2	½ Q.	Mar., 1912
Harbison-Walker, pr	100	.....		9,600,000	6 cum.	1½ Q.	Jan., 1912
International Pump	30⅜	+2⅜	Dec. 13	17,762,500		½ Q.	Apr., 1905
International Pump, pr	81	+ ½		11,350,000	6 cum.	1½ Q.	Feb., 1912
Lackawanna Steel	30	.....	Mar. 13	34,978,300		.....	
Lake Sup. Corp	29	—1	Oct. 2	40,000,300		.....	
New York Air Brake	50	.....	Mar. 13	10,000,000	6	1½ Q.	July, 1911
Niles-Bement-Pond	95	.....	Feb. 7	8,500,000	6	1½ Q.	Mar., 1912
Niles-Bement-Pond, pr	104	.....		2,000,000	6 cum.	1½ Q.	Feb., 1912
Otis Elevator Co	80	+7	Mar. 18	6,358,600	4	1 Q.	Jan., 1912
Otis Elevator Co., pr	101	.....		6,375,300	6 n. c.	1½ Q.	Jan., 1912
Pa. Steel	60	.....	May 13	10,750,000		.....	
Pa. Steel, pr	100⅛	+ ⅛		20,587,500	7 n. c.	3½ S. A.	Nov., 1911
Pittsburgh Coal	19⅝	+2⅜	Mar. 12	28,104,600		.....	
Pittsburgh Coal, pr	82	+3	Oct. 7	27,071,800	7 cum.	1¾ Q.	Jan., 1912
Pittsburgh Steel Co., pr	101¼	.....	Feb. 21	7,000,000	7 cum.	1¾ Q.	Mar., 1912
Pressed Steel Car	31¾	+1¾		12,500,000		1 Q.	Aug., 1904
Pressed Steel Car, pr	100	+3	Nov. 13	12,500,000	7 n. c.	1¾ Q.	Feb., 1912
Pullman	159⅛	+ ⅛	Mar. 7	120,000,000	8	2 Q.	Feb., 1912
Railway Stl. Spring	30	+2¼		13,500,000	2	1 S. A.	Oct., 1908
Railway Stl. Spring, pr	101	—1½	Oct. 16	13,500,000	7 cum.	1¾ Q.	Mar., 1912
Rep. Iron & Steel	19¾	+ ¾		27,191,300		.....	
Rep. Iron & Steel, pr	70½	+1	Mar. 13	25,000,000	7 cum.	1¾ Q.	Jan., 1912
Sloss-Sheffield	41⅛	+1⅛		10,000,000	5	1¼ Q.	Sept., 1910
Sloss-Sheffield, pr	112	.....	June 26	6,700,000	7 n. c.	1¾ Q.	Jan., 1912
U. S. Pipe & Fdy. Co	14¼	— ⅝		12,500,000		1 Q.	Dec., 1907
U. S. Pipe & Fdy. Co., pr	51¾	+ ½	April 15	12,500,000		1¼ Q.	June, 1911
U. S. Steel	64⅞	+3½		508,302,500	5	1¼ Q.	Mar., 1912
U. S. Steel, pr	110¼	+2		360,281,100	7 cum.	1¾ Q.	Feb., 1912
U. S. Steel 5s	102⅞	— ⅛	Sept. 17	465,189,500	5	.....	
Va. Iron, Coal & Coke	60	+5	Oct. 1	9,073,680		5. †	Oct., 1907
Westinghouse Air Brake	163	+3	June 12	14,000,000*		5 Q.‡	Jan., 1912
Westinghouse Electric	73⅞	+ ⅜		3,998,700*	7 cum.	1¾ Q.	Jan., 1912

Par value of shares, $100, except those starred (*), $50.
**Includes last 1 per cent payment of 4 per cent extra.
†Stock.
‡Include 2½ regular, 1½ extra and 1 special.

Copper Stocks.

New York.—Amalgamated Copper closed 71, a net gain of 3.

Boston.—Anaconda closed 37¼, a net gain of 1½; Calumet & Arizona closed 62, a net gain of ¾; Calumet & Hecla closed 451, a net loss of 9; North Butte Mining closed 27¾, a net gain of 1¼; Quincy Mining closed 80, a net gain of 1.

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Controlling Prices

The proposal of Judge Gary, made in his suggestion of a federal license act, that the federal commissioners shall fix the maximum prices of any products under certain conditions, is a radical departure and we are not prepared to endorse it. We do not, however, concur in some of the objections which have been made to it. Some writers seem to be of the opinion that prices are fixed by immutable laws of nature and cannot be changed or regulated by the government. For example, the *New York Times* says: "A price is an agreement between buyer and seller and embodies the result of a conflict between opposing interests. No agreement can be made by law. No law can control the result of conflicting forces unless it can control the forces. A law may declare the maximum price, but it cannot compel production at that price, nor can it compel the payment of the price. The law cannot do these things because it cannot compel the meeting of minds which are free to disagree about values, and because it cannot control the forces which fix values. Prices are dependent upon costs and the government cannot control costs."

The best answer to statements of this kind is that prices have been controlled by mutual agreement of people who have much less power and authority than the government. Prices are not necessarily an agreement between opposing interests, for it is often to the interest of both buyer and seller that reasonable prices prevail. The law can, to some extent at least, control buyers and sellers by requiring that their methods shall be fair and not oppressive. Costs are, of course, an important factor of prices, but they are not the only factor. The man who, the other day, as shown by the investigation of a district attorney, bought eggs from a farmer at 17 cents and sold them for 50 cents, could hardly claim that his prices were dependent upon costs.

Many business men are not as much opposed as might be imagined to government regulation of prices. Some of them believe that both maximum and minimum prices should be determined by the government. Others would like to see the government authorize manufacturers to combine and regulate prices under government supervision. Still others realize that present conditions are extremely unsatisfactory, but are not prepared to suggest a remedy, except, perhaps, to endorse President Taft's idea of an industrial commission, which was favorably received at a meeting at Pittsburgh last week of bridge builders. Our own opinion is that price regulation by the government ought to be avoided unless it is found impossible materially to improve business conditions by less socialistic methods.

Railroad Operations Good

The authoritative statistics summarized by the Bureau of Railway Economics show that December railway earnings bore the same relation to those of the corresponding month a year earlier as prevailed throughout 1911, while the result of the entire calendar year 1911 showed practically no change from 1910 in gross or net operating revenue, taking the railroads of the country as a whole. The reports used are those of all roads more than 50 miles long. On account of the increase in the average mileage of road operated, from 227,444 miles in 1910 to 230,913 miles in 1911, there were slight decreases in the results per mile of road, these amounting to 2.5 per cent in total operating revenue and 4.0 per cent in net operating revenue, comparing the calendar years 1910 and 1911.

Car buying by railroads this year has been heavier than is generally appreciated, the movement appearing light by comparison with the heavy orders which were placed during a short period late in 1911. To date this year the railroads have bought fully 20,000 freight cars. This compares with a total of about 130,000 bought in 1911, according to the statistics of the *Railway Age Gazette,* but it should be observed that more than half of this total was placed in the three closing months of 1911. The orders were very light during the first nine months of that year.

All the evidences are that the railroads have been working out their salvation, since the adverse decisions in the "advanced rate cases" on Feb. 22, 1911, much more successfully than was regarded as conceivable while decision in those cases was pending.

Extending the Usefulness of Universities

A novel technical extension plan is suggested by a mechanical engineer of New York, a graduate of Ohio State University, in a letter to the editor of THE IRON TRADE REVIEW. It points out that for years, Ohio State University has been helping the farmers by giving them definite information. "If," he says, "a farmer wants to know what is the matter with his seed or soil, or why his rotation of crops fails, he has ready access to the professors of the agricultural college of the university, who gladly answer all his questions. Why cannot a man who runs a factory come along and ask questions about his steam and steel and oils, and receive just the same ready responses? By rendering this service, the university would bring the students in mechanical and technical lines in touch with the actual problems which beset the superintendents of both large and small plants, for I advocate the answering, whenever possible, of these questions by the investigation of students under the professors. The senior would be given,

at times, a real thesis to write instead of working upon a subject of no practical value. In his thesis, he would be compelled to answer the dollars and cents question. This plan would also bind the mechanical interests in the state to the university."

The New York engineer submitted his proposition to another engineer, well acquainted with conditions at state universities, who expressed the opinion that the plan might not be feasible because it would interfere with numerous professors getting fees which they now receive. To this objection our correspondent replies, "I had thought of the real expert advice of professors and their fees being cut into, but I had not believed that these fees would be materially reduced. Agricultural experts are still collecting their fees and the general dissemination of agricultural inquiry through interesting the farming public has really added to the inquiries which result in fees. The schools are raising the general tone of the farming industry and giving the investigator more work to do than ever before. The professors are public servants. Perhaps if people were more interested in them, they would be paid sufficiently, so that they could afford to be experts for the state rather than experts for the trade. At the beginning, however, highly advanced work could not be done by the college. I believe the state should take up the lower grade of work for the shop men as it is doing for the farmers."

Obstacles can always be found by those who are looking for them and there probably are some genuine difficulties in the way of introducing the plan proposed. We believe, however, that it is worthy of careful consideration, and that something could be accomplished very soon. With a small beginning, great results might come later.

Why Not?

Why not regulate labor unions? Judge Gary has proposed a radical method of regulating great corporations. We should now like to see someone draft a bill to regulate labor unions. Regulation by the government would, in all probability, result in compelling manufacturers to recognize the unions. Hence, fair-minded union men ought to favor such regulation. On the other hand, manufacturers who for years have been saying that they were not opposed to labor unions, but only to the objectionable features of such organizations, ought not to object to recognizing unions properly controlled. If corporations are to be prevented from forming monopolies and charging extortionate prices, and from oppressing labor, why should not labor unions be granted licenses subject to revocation in case they indulge in boycott, perpetrate violence or do anything else contrary to the interests of the public?

Insuring a Monopoly

Chairman Topping, in his testimony recently given before the senate committee on finance, called attention to the fact that German manufacturers, because they are allowed to co-operate under government supervision, are much better able to compete for the commerce of the world than is the country where co-operation is forbidden by law.

It is a well known fact that 90 per cent of the export business of this country in iron and steel is carried on by the United States Steel Corporation, and that independent manufacturers found it impossible without co-operation to extend their foreign business to any appreciable extent. A few weeks ago, Mr. Topping endeavored to organize a company to carry on the export business of the independent companies as the United States Steel Products Co. conducts the export department of the Steel Corporation. On this subject, Mr. Topping said to the committee, "If we, the manufacturers here, got together as I was trying to get together recently, a body of manufacturers to form an export company and have a central selling agency, our attorneys tell us we would be open to possible attack as violating the Sherman anti-trust act. And yet our purpose in combining would be for the extension and not the restraint of trade."

In other words, the Sherman law in this case does exactly the opposite of what it is trying to do. Instead of encouraging competition in the export trade and giving the independent companies a chance, the anti-trust act insures a monopoly for the Steel Corporation. This is only another instance of many that might be cited of the importance of more systematic, intelligent regulation of business.

Poor Service and Unpaid Bills

In the last two or three years we have heard a great deal about economies in the post office department under the management of the able Mr. Hitchcock. But we have not heard so much about the corresponding deterioration in the quality of the service, about the slow deliveries, the delays and failures of the present system with the attendant loss of trade and increased expense which they force upon the business community.

Many instances of poor service could be cited in which the weather could not be given as an excuse. From Cleveland to Chicago, via the Lake Shore, the distance is 357 miles. Few passenger trains require over eight hours to make the run, some do it in seven and one in six. Now, here is the mail record.

A letter posted in Cleveland at 7 p. m., Feb. 12, with a *special delivery* stamp attached, was not delivered in Chicago until 11 a. m., Feb. 13, being 16 hours enroute. Another letter, without special delivery, mailed in Cleveland at 9 p. m., Feb. 8, was delivered in Chicago at 5 p. m., Feb. 9, 20 hours in transit. Because of the latter delay, it was necessary to send two telegrams and write two extra letters, at a total cost of not less than a dollar. This shows how the public pays for post office "economy".

Business men are glad to see genuine economy, but they are also interested in the efficiency of the department and are right in demanding reasonable dispatch in handling the mails. The economies we hear so much about have been largely attained through cutting down forces and crippling the machinery of the system, and in spite of all the praise that has been heaped on Mr. Hitchcock, it is not apparent that he has made such a remarkable showing. It has developed that $7,201,149.64 of accounts of 1911 and previous years were not paid on or before June 30 of last year, but were carried over to the present year and paid between July 1 and Sept. 30. Had they been paid when due, there would have been a deficit of $6,982,031.53, instead of a surplus, as given in the Postmaster-General's report, of $219,118.11.

MEN OF THE IRON TRADE

H. M. Steward has been appointed chief engineer of maintenance of way, of the Boston Elevated railway.

R. M. Smith, of New Britain, Conn., has assumed the management of the Stanley works, at Niles, O.

E. H. Gary, chairman of the United States Steel Corporation, has gone to Florida, where he will spend two or three weeks.

W. D. Sayle, president of the Cleveland Punch & Shear Works Co., Cleveland, is spending two weeks in touring the south.

J. E. Love, 505 Second avenue, Detroit, has been appointed Michigan representative of the Halcomb Steel Co., Syracuse, N. Y.

F. E. Guy has been appointed assistant eastern traffic manager for the Universal Portland Cement Co. with offices in the Frick building, Pittsburgh.

F. B. Fleming has been placed in charge of the Detroit Hoist & Machine Co.'s recently opened Chicago office, which is located at 1200 Karpen building.

Henry S. Hayward has been made consulting engineer of the floating equipment of the Pennsylvania railroad with headquarters at Jersey City, N. J.

C. T. Fairbairn, Birmingham, Ala., general manager of the southern district of the Republic Iron & Steel Co., made a brief visit to the head offices at Youngstown, O., last week.

Peter Kirkevaag, who has been employed by the William Tod Co., Youngstown, O., for 27 years, first as a draftsman and later as a mechanical engineer, has resigned.

O. Z. Howard, formerly identified with the United States naval engineering experiment station, Annapolis, Md., has accepted a position with the Griscom-Spencer Co., New York.

Edgar B. Black, who has been in the Buffalo office of the Republic Iron & Steel Co. for the past year, is now traveling through New York state for the company.

E. R. Humpage, formerly vice president and general manager of the E. R. Thomas Motor Car Co., of Buffalo, has been elected president of the corporation to succeed E. P. Chalfant.

George Langton has been appointed master mechanic of the Texas & Pacific, succeeding O. A. Clarke, who was transferred to Dallas, Tex. Mr. Langton will be located at Marshall, Tex.

F. A. Haughton, until recently general superintendent of the Taylor Iron & Steel Co., High Bridge, N. J., has accepted a position with the Remington Arms & Ammunition Co., Ilion, N. Y., as works manager.

W. A. Cornelius, general manager of the National Tube Co., McKeesport, Pa., gave a talk on the evening of March 4, at the Y. M. C. A. building in that city on "Push vs. Pull."

James A. Campbell, president of the Youngstown Sheet & Tube Co., Youngstown, O., accompanied by Mrs. Campbell, has gone to Hot Springs, Ark. They will remain there about three weeks.

P. E. Carhart, inspecting engineer, with the Illinois Steel Co., Chicago, was in an elevator accident in the Commercial National Bank building, Chicago, March 9, and suffered a broken leg.

H. E. Bek and E. A. Truth have formed a partnership and engaged in consulting electrical engineering and contracting under the name of Kanawha Engineering Co., at Charleston, W. Va.

James Plummer, formerly representative for the Newport News Shipbuilding & Drydock Co., in Pittsburgh, has been transferred to Philadelphia, to take charge of the office there, in the Bourse building.

Ward F. Pattengill has resigned his position in the credit department of the Youngstown Sheet & Tube Co., Youngstown, O., and accepted the position of manager of credits for the Brier Hill Steel Co., of that city.

E. G. Grace, general manager of the Bethlehem Steel Co., and J. H. Ward, private secretary to Charles W. Schwab, president of the corporation, have gone to Europe for several weeks.

Col. George W. Goethals, chief engineer of the Panama canal, recently inspected the Kiel and Tilton canals in Germany. He will go to Rotterdam and Antwerp to study the terminals there.

John O. Johnson has been appointed master mechanic on the docks of the Pittsburgh & Ashland Coal & Dock Co., at Ashland, Mich. The position is a newly created one and Mr. Johnson will have the general supervision of all of the dock work.

E. R. Knowles, consulting engineer, New York, has been appointed on the White House commission established by President Taft, for increasing the economy and efficiency of the engineering departments and buildings of the United States.

Franklin H. Reed, who for several years was associated with public utility operating and engineering work, has resigned his editorial position with Telephony and joined the organization of the traffic service bureau of Chicago and Washington.

Alfred Still has been appointed chief electrical engineer of the Lake Superior Power Co., with headquarters at Sault Ste. Marie, Ont. He has been connected with large projects in various parts of the world, having recently come to America from England.

George L. Claypool, district sales manager for the Republic Iron & Steel Co., at Pittsburgh, accompanied by Mrs. Claypool, sailed last Monday, for a 21 days' cruise in southern waters, and will visit the Bermudas and Panama.

Frank H. Crockard, Birmingham, vice president and general manager of the Tennessee Coal, Iron & Railroad Co., has gone to Palm Beach to be absent for a few weeks. He was accompanied by other Birmingham people.

Charles H. Craig Jr., has associated himself with Edward H. McClintock, under the firm name of McClintock & Craig, engineers and architects, with offices at Springfield, Mass. Mr. Craig was formerly with Charles T. Main, of Boston.

Jacob T. Grim, York, Pa., who for several years has represented the slag roofing department of the Lancaster Sheet, Metal & Supply Co., has purchased the good will and interest of the company in that business and will conduct it himself.

Robert Hatfield Irons, superintendent of mill No. 1 of the Central Iron & Steel Co., Harrisburg, Pa., has been appointed general superintendent of the plant, to succeed George R. Bentley, who resigned several monhs ago. Mr. Irons will be succeeded by Wal-

MEN OF THE IRON TRADE

ter S. Bentley, his former chief clerk, and a son of George R. Bentley.

Harry R. Bond has been elected to succeed T. S. Bailey as secretary-treasurer of the New London Ship & Engine Co., New London, Conn. Mr. Bailey has moved to Seattle to resume his duties in the offices of the Electric Boat Co.'s plant.

J. J. Eyre, formerly superintendent of the pattern shops of the General Electric Co., Schenectady, N. Y., has taken an interest in the Standard Pattern Works, Rochester, N. Y., and is actively engaged as general manager and superintendent.

Prof. J. F. Barker, principal of the Technical High School, Cleveland, who was unable to deliver his address on "Technical Education," before the Cleveland Engineering Society, on Feb. 27, because of an attack of tonsilitis, has recovered and is able to resume his duties.

Thomas W. Casey, general manager of the Pay-as-You-Enter Corporation, has returned from a trip to Europe. The P-A-Y-E cars for the Gateshead lines of the British Electric Traction Co. are now under construction and will be ready to operate about April 1.

Willard Bayliss, superintendent of the Leonard-Clark properties of the Oliver Iron Mining Co., has returned from a several weeks' trip through the south. He spent some time in Florida on personal business and on his return trip inspected the iron districts of Alabama and Tennessee.

Fred L. Smith has been appointed superintendent of the manufacturing department of the Janesville Machine Co., Janesville, Wis., with which he has been associated for 19 years. Charles E. Sanders, of Chicago, has been appointed superintendent of the cost, purchasing, stock and shipping departments.

Walter H. Allen, member of the American Society of Civil Engineers, civil engineer, United States navy, has been transferred to the New York navy yard at Brooklyn, N. Y., succeeding A. L. Parsons, who goes to Washington, D. C. Mr. Allen was formerly connected with the bureau of yards and docks, Washington, D. C.

John Patterson has been appointed assistant master mechanic of the open hearth plant of the Republic Iron & Steel Co., Youngstown, O. He was formerly employed as millwright foreman having had charge of the erection of the mill. Previous to that he was employed by the Youngstown Sheet & Tube Co.

Elmer Clarke has been appointed acting private secretary to Vice President J. V. W. Reynders at the steel plant of the Pennsylvania Steel Co., Steelton, Pa., succeeding C. R. Holton. Mr. Holton has accepted the position of purchasing agent for the receivers of the Central Iron & Steel Co.

W. M. Bond has been appointed division engineer of the Monongahela division of the Baltimore & Ohio, being transferred from the position of division engineer of the Baltimore & Ohio Southwestern, at Chillicothe, O. H. M. Hayward, assistant engineer at Cincinnati, succeeds Mr. Bond.

L. L. Griffiths has opened an office in Dallas, Tex., as president of the L. L. Griffiths Engineering Co., consulting civil, mechanical and electrical engineers. He had resigned as general superintendent of the Texas Portland Cement Co., but retains his position as consulting engineer for that concern.

Clayton W. Pike, member American Institute of Electrical Engineers, has been appointed chief of the electrical bureau of Philadelphia, at a salary of $6,000 per year. He succeeds James F. McLaughlin. Mr. Pike was formerly vice president and general manager of the Keller-Pike Co., electrical engineer, Philadelphia.

Charles H. Repath and A. G. McGregor, mechanical engineers, have formed a partnership under the firm name of Repath & McGregor, to conduct an engineering business, specializing in mechanical and electrical engineering of metallurgical and mining plants. They have been associated with the Amalgamated Copper Co.

E. A. Wilson has resigned as manager of the Ohio File Renewing Co., Niles, O., to become manager of the metal lath department of the Brier Hill Steel Co., Youngstown, O. At the annual election of the former company, recently held, W. F. Thomas was elected president and treasurer; H. A. Hoffmaster, vice president and E. A. Wilson, secretary. Mr. Thomas will manage the business until a successor to Mr. Wilson is secured.

R. S. Prentice, formerly with the Electric Machinery Co., Minneapolis, is now in charge of the engineering department of the Railroad Supply Co., Carroll and Robey streets, Chicago. Mr. Prentice is a graduate of the University of Minnesota, and held various engineering positions throughout the west before taking up his present work.

E. C. Felton, president of the Pennsylvania Steel Co., has returned from a trip to the company's mines in Cuba. The old properties on the south end of the island, near Santiago, were visited first, and afterward the new mines at Mayari on the north side of the island. He found conditions at both of the company's mining properties excellent.

C. C. Owens has been placed in charge of the Detroit district sales office of the Westinghouse Electric & Mfg. Co., with the title of district manager. For the last eight years he has been connected with the New York sales office, having had charge of the industrial and power division for the two years previous to his transfer to Detroit.

Capt. J. N. Porter, who opened the first mine in the Iron River district and who for several years had charge of all of the mines in both the Iron River and Crystal Falls districts, has assumed charge of the mining operations of the Iron River Ore Co. at its recently opened Buchholtz property. Capt. Porter is one of the best informed men on mining conditions in the Iron River district.

G. S. Scott, formerly second vice president, R. M. Ripley, formerly third vice president, and W. J. Lynch, formerly fourth vice president of the American Steel Foundries, have been advanced to the first, second and third vice presidencies, respectively. These changes were necessitated by the vacancy created by the promotion of R. P. Lamont, formerly first vice president, to president. Several changes in the directors are slated for the meeting March 21, to fill vacancies.

Milton P. Higgins Dies

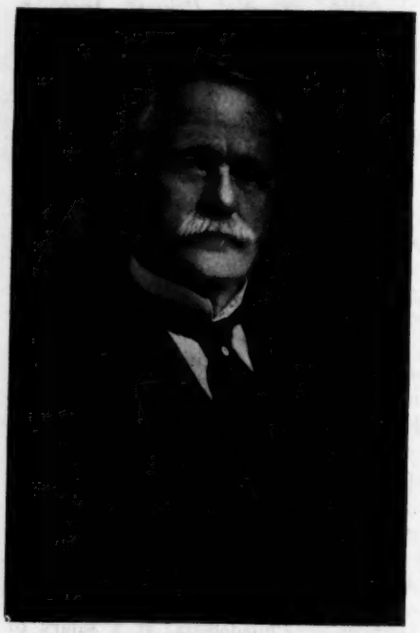
Milton Prince Higgins, president of the Norton Grinding Co. and of the Norton Co., Worcester, Mass., father of the "Half-time" trade school plan, and one of the most widely known men in industrial circles in the United States, died Friday night, March 8, in Worcester, of heart disease, aged 69 years. He had been confined to his bed about two weeks.

Mr. Higgins was born in Standish, Me., Dec. 7, 1842. He was of an old Cape Cod family that came over from England in 1633.

Leaving the farm at the age of 17 years he went to Manchester, N. H., and served an apprenticeship in the Amoskeag Mfg. Co.'s shops. He studied evenings, with the result that he was able to acquire a college education. He graduated from Dartmouth college in 1868 with the degree of bachelor of science. Mr. Higgins probably took more pride and satisfaction in his training as a machinist than many young men of today would take in a college education, and it was characteristic of him that he retained his pride in his trade all his life.

After graduating from college he became a draftsman in the old Washburn & Moen wire works, now the American Steel & Wire Co., of Worcester, under the late Charles Hill Morgan, with whom he was associated afterwards for many years in the Worcester Polytechnic Institute. It was at this time that Mr. Higgins was selected by Mr. Morgan and other trustees of the Worcester Polytechnic Institute to carry out the unique idea of Ichabod Washburn for a shop that should train the students and at the same time be a commercial success. Mr. Higgins served as superintendent of the Washburn shops of the Worcester Polytechnic Institute for a period of 28 years. He built up several lines of business there in devices of his own design, such as machine tools, special grinding apparatus and the hydraulic elevator of the direct-acting plunger type. The marked success of so many of the older graduates of this now well-known institution is attributable in no small degree to the atmosphere of commercial industry and thrift that pervaded the Washburn shops under Mr. Higgins' administration.

While engaged in solving the problems of the Washburn shops, Mr. Higgins undertook other enterprises that his judgment commended. In 1885 he foresaw possibilities of the emery wheel business that was then being conducted by the late F. B. Norton. In company with his associate, Prof. George I. Alden, also of the Worcester Polytechnic Institute, Mr. Higgins took over this little business and organized the Norton Emery Wheel Co. They retained Charles L. Allen as general manager and John Jeppson as superintendent, and this organization, with Mr. Higgins as president, and Mr. Alden as treasurer, remained intact until broken by the death of Mr. Higgins. The development of the great abrasive industry of the present Norton companies with their extensive works in Worcester, their alundum-making plant at Niagara Falls, N. Y.; their crystolon plant in Canada, their works in Wesseling, Germany, and their mines in various parts of the United States; also the works of the Norton Grinding Co., in Worcester, for the manufacture of grinding machines, all stand as monuments to Mr. Higgins' business judgment and ability.



MILTON P. HIGGINS

In 1889, Mr. Higgins was granted a year's leave of absence from the Worcester Polytechnic Institute, in order that he might organize the shops of the Georgia School of Technology, in Atlanta, Ga. He also later organized the shops of the Miller Manual Labor Training School, in Virginia. In 1896 the trustees of the Worcester Polytechnic Institute decided that the commercial end of the Washburn shops was becoming too important. So they sold the hydraulic elevator business to the man that had developed it. Mr. Higgins and Prof. Alden then severed their connections with Worcester Tech and organized the Plunger Elevator Co., now one of the largest concerns of its kind in the country.

In 1904 Mr. Higgins picked out another struggling business, the Worcester Ferrule & Mfg. Co., owned by the Converse estate. He reorganized this as the Worcester Pressed Steel Co., taking the presidency himself, with Prof. Alden as treasurer, and his son, John W. Higgins, as general manager. The business has been developed into one of the leading industries of the city.

In 1903 Mr. Higgins was appointed trustee of the Worcester Polytechnic Institute, so that his services to that institution were practically continuous for a period of 43 years. At the time of his death he was also president of the Manchester Supply Co., of Manchester, N. H., and of the Sanford Riley Stoker Co., Ltd., of Providence. He was a former vice president of the American Society of Mechanical Engineers, and a charter member of the Society for the Promotion of Industrial Education.

Mr. Higgins was the originator of the "half-time" trade school proposition, designed to afford boys opportunities to obtain good school educations and at the same time put in half their time in shops under most favorable conditions for learning trades. This proposition of Mr. Higgins' met with much favor by prominent men in the industrial world and did more than any other one thing to start the present movement for industrial education. There are now many schools in this country which have followed Mr. Higgins' original idea. Mr. Higgins wrote many papers on industrial education and was in great demand for his practical talks on behalf of the useful education of the boy. He was the father of the Worcester Trade School, which was founded in 1909.

Death of Joseph C. Ford

Joseph C. Ford, one of the best known iron men of the central west, died unexpectedly, March 5, at the Butterworth hospital, in Grand Rapids, Mich., as briefly noted in last week's issue of THE IRON TRADE REVIEW. Mr Ford was born in Central Valley, N. Y., and when a young man went west. He was first employed by his uncle, Henry Ford, as bookkeeper at the old charcoal furnace located at Lawton, Mich. This has long since been out of active operation. Later he moved to Bangor, Mich., and was bookkeeper at the furnace there.

When Major Pickands built the Spring Lake furnace, in 1880, Mr. Ford

went with him as bookkeeper and remained as such until 1883, when Major Pickands removed to Chicago to become a partner in the firm of Pickands, Brown & Co. Mr. Ford became superintendent of this furnace and held this position until about 1900, when he acquired the sole ownership. In 1905, in conjunction with other interests, he organized the Mitchell-Diggins Iron Co. and built the Cadillac furnace at Cadillac, Mich. He had full charge of this furnace ever since the organization.

Mr. Ford was vice president of the Hackley National Bank at Muskegon, Mich., and was an officer and director in many other companies.

Israel Sive, aged 42, formerly a member of the firm of Watelsky & Sive, of Cincinnati, died on Feb. 21, at Johannesburg, South Africa, where he had gone in search of health.

John Mansfield Douglas, of the firm of W. B. Douglas, 83 John Street, New York, pump manufacturers, died of pneumonia Feb. 29, aged 40 years.

Edwin F. Brown, president of the Brown Specialty Machinery Co., Chicago, died in that city on Feb. 15. The company will continue under the direct management of its treasurer, Elmer A. Rich Jr., and there will be no change in its policies.

John Malcolm Mossman, president of the J. M. Mossman Co., New York City, manufacturer of locks and safes, died in that city March 5, aged 66. He had been engaged in the manufacture of safes throughout his business career and was ranked as an expert on matters of bank vaults.

George H. Turner, of Torrington, Conn., vice president of the American Brass Co., died Feb. 29, in the Hahnemann hospital, New York, following an operation for hernia. He was 45 years of age and was born on Prince Edward Island. He was formerly associated with the U. T. Hungerford Brass & Copper Co., and later with Wallace & Sons, of Ansonia. Mr. Turner's father preceded him in death by one week.

A famous figure has disappeared from the British Iron and Steel Institute through the death of Sir John Alleyne, Bart., in his ninety-second year. He was vice president of the Iron and Steel Institute, was M. I. C. E., and M. I. M. E., and became a member as long since as 1869, in the same year as the late Lord Airedale, and Sir Hugh Bell, Bart., who is still an active member. The deceased baronet was an eminent engineer, and was responsible for the building of the enormous span roof at St. Pancras station. From 1852 until 1880 he was engineer and manager of the Butterly Iron Works, Derbyshire.

Frederick W. Doty Sr., president of the Doty Engine Works, Ltd., of Goderich and Winnipeg, dropped dead of heart failure at his residence, Goderich, on the night of Feb. 26. He had apparently been in good health. Mr. Doty was 60 years old, and was the son of the late John Doty, of Toronto, formerly head of the John Doty Engine Works, Toronto. He had resided in Goderich for about 15 years. The present company, which is an extensive manufacturer of marine engines, recently opened a plant at Winnipeg. Mr. Doty was a prominent member of the Conservative party and took an active interest in public affairs. Of his four surviving sons, John Doty, of Troy, N. Y., is widely known as a civil engineer, Frederick is manager of the Goderich plant, Frank is western manager and Charles, superintendent of the shipping department.

Discusses Tap Making

F. A. Wells, president of Wells Bros. Co., Greenfield, Mass., presented a paper on "Practical Problems in Tap and Screw Making," before the American Society of Mechanical Engineers, at the Engineering Societies building, 29 West Thirty-ninth street, New York City, Tuesday evening, March 12. The speaker dealt with the importance of size and lead in the cost of assembling manufactured work, the practical limits of accuracy, reasons for abandoning the V thread, the proper size of tap drills, the power required for tapping, the effect of lubricants on size and power and other points. Other tap makers were present and discussed the subject.

The Taylor System. — The Taylor system of shop management which has been under investigation by a special house committee for several months was described in that committee's report, made last week, as not fit for adoption in its entirety in any government workshop. The system has been tried in the government arsenal at Rock Island, Ill., and the arsenal at Watertown, Mass., where employes went on strike when the system was installed. Strikes also were threatened at the Washington navy yard.

The Cowley Iron Works, Cowley, La., will be reorganized in the near future, according to information recently given out.

LESS ORE MOVED

From Lower Lake Docks to Furnaces in February, 1912.

The movement of iron ore from lower lake docks to furnaces in February amounted to 39,259 tons, compared with 527,500 tons in February, 1911. The decrease was due entirely to the unusually severe weather last month. Men who have been handling ore for years say that never in their recollection was the ore frozen to so great a depth.

As soon as the thaw sets in it is expected that the movement will be very heavy.

Building is Leased

The L. A. Green Co., 419-420 Park building, Pittsburgh, dealer in rails, machinery and equipment for mines, mills and contractors, has leased, for a long term of years, a building now being constructed to suit its requirements at 3145 Penn avenue, Pittsburgh. The building is to be completed by April 1. It will contain about 7,000 square feet of floor space, and will be provided with display rooms in addition to offices and warehouses. Papers are now being prepared to change the name of the company to the L. A. Green Equipment Co. The company intends to continue along the same lines as heretofore, but on a larger scale.

Chicago Foundrymen's Club

The March meeting of the Chicago Foundrymen's Club will be held Saturday evening, March 16, at the Great Northern hotel. A. O. Backert, editor of THE FOUNDRY, will address the club on "What Foundrymen's Organizations Have Not Accomplished." After the meeting, a buffet luncheon will be served and an informal reception tendered Mr. Backert.

Takes Contracts in Germany

The European office of H. Koppers announces that it has secured contracts from the city of Berlin, Germany, for a large number of by-product gas ovens. These ovens will be designed to produce metallurgical coke as well as a high quality of gas. Contracts for similar installations have been obtained at Kiel, Germany, and Tokio, Japan.

The Phillips Gasoline Engine & Motor Co., Chicago, has changed to W. L. P. Co.

REPORT IS FAVORABLE

Taylor Iron & Steel Co. Has Successful Year.

At the annual meeting of the stockholders of the Taylor Iron & Steel Co., held at High Bridge, N. J., on March 5, the annual report showed that the earnings for the year 1911 were very satisfactory, although there had been a falling off of business as compared with 1910. Besides the regular 7 per cent dividend on the preferred stock, 6 per cent on the common stock is being paid and in addition thereto, surplus and reserve accounts increased. The company reports its business as being in a very prosperous condition, and its plant and equipment, through recent extensions and additions, is in excellent condition to handle a largely increased business.

The following directors were elected: Henry M. Howe, Knox Taylor, L. H. Taylor Jr., E. H. Earnshaw, H. J. Cochran, Edgar S. Cook, A. E. Borie, V. G. Simkhovitch, James Imbrie. The board organized by electing these officers: President, Knox Taylor; vice presidents, A. E. Borie and H. M. Howe; secretary and treasurer, W. A. Ingram.

Foreigners Hold Large Blocks of Steel Stocks

According to statistics compiled by the New York *Times*, the list of holders of stock of the United States Steel Corporation has increased 3,000 to 4,000 during the past three months. An interesting feature shown is that the foreign holdings in that period have increased to a total of $144,782,300, divided into $114,840,800 common and $29,941,500 preferred. These figures are equivalent to 22.59 per cent of the total outstanding common stock and 8.31 per cent of the total preferred stock of the Corporation. England is by far the largest foreign holder of steel securities, being credited with $80,163,300 common and $17,687,500 preferred. Holland is next with $24,411,300 common and $2,634,000 preferred. Canada has $2,578,200 common and $3,628,500 preferred. The other holdings in smaller amounts are scattered over many countries. It is stated that the foreign ownership of United States Steel securities is by far the largest of any single American enterprise held by investors in other countries. The present total number of stockholders of record of the United States Steel Corporation is about 108,000, of which 69,993 are holders of the preferred stock. The actual number of holders greatly exceeds these figures since large blocks are held in the names of investment companies or brokerage firms for different individuals. It is known that the total number of individual holders exceeds 125,000 and it is believed that the actual figure is close to 150,000.

METAL MEN ELECT

At Annual Meeting of Cleveland Branch of Society.

The annual meeting of the Cleveland branch of the National Metal Trades Association was held in the library of the Chamber of Commerce, March 7. After the luncheon the retiring president, C. O. Bartlett, spoke briefly and the secretary, Philip Frankel, submitted his report. The following officers were elected: President, C. B. Wilson, vice president of the Ferro Machine & Foundry Co.; vice president, James H. Foster, Hydraulic Pressed Steel Co.; treasurer, Frederick Metcalfe, Chase Machine Co.; executive board, the officers and W. A. Comstock, Cleveland Wire Spring Co.; J. G. Sparrow, National Safe & Lock Co.; John Hertner, Rauch & Lang Carriage Co.; George Canning, Cleveland City Forge & Iron Co., and George D. Cowley, Hill Clutch Co.

Homer H. McKeehan, a prominent Cleveland attorney, addressed the members on the Ohio employers' liability law. At the present time very few Cleveland manufacturers have signified their willingness to operate their plants under this law, but many are in doubt as to what they ought to do. Mr. McKeehan did not make an argument either for or against going under the law, but confined his remarks largely to an explanation of the law and of the cases in which a company would not be protected even if it does accept the law and pay in the required premiums.

Won't Analyze Ore

Frank L. Crobaugh, Cleveland, analytical and consulting chemist and metallurgist, announces that he has disposed of that portion of his chemical business which consists of the sampling and analyzing of iron ore in shipments or storage for the purpose of adjustment between the buyer and the seller and will not hereafter have the organization for carrying on this line of business. He says that he will continue to operate as an analytical and metallurgical chemist at his old address, 1501 Columbus road N. W.

GENERAL MEETING

Of American Iron and Steel Institute to be Held in May.

Preliminary arrangements are being made for an important general meeting of the American Iron and Steel Institute to be held in New York City early in May. The annual meeting of the institute is provided by constitution to be held in May and this year it is planned to arrange such a program as will call forth the full attendance of the members of the organization. In connection with the annual business session, a program of papers dealing with various phases of the iron and steel industry will be presented and in the evening a banquet will be held. The meeting will occupy but one day and will be the first general assembly of the institute since the gathering in October, 1910, at which a score or more of foreign steel masters were entertained as guests of honor. Arrangements for the meeting are now in the hands of a committee of directors and will shortly assume definite form. Important business matters will be up for consideration at the approaching meeting.

Addresses Foundrymen. — Richard Moldenke, secretary of the American Foundrymen's Association, addressed the New England Foundrymen's Association at the Exchange Club, Milk and Batterymarch streets, Boston, Wednesday evening, March 13. The address was preceded by the usual dinner. The association is planning to hold its May meeting in Hartford, Conn., and it is expected there will be a large attendance from among the Connecticut members of the association.

Will Ship Its First Ore.—The Consolidated Vermillion Steel Co. has entered a body of ore at its Vermillion range shaft, at a depth of 340 feet. The ore is similar in appearance and structure to the Ely ores. The ore was reached with a crosscut and according to President T. J. Walsh, the company will make its first shipment of ore this year. The property is located a short distance north and east of Lake Vermillion, in Section 5, township 62, range 14.

The Newport Mining Co., operator of the largest ore mines on the Gogebic iron range, near Ironwood, Mich., employing in the neighborhood of 2,000 men, is completing a hospital at its mine which will be used for injured employes. It will have all of the latest equipment.

STOCK BUYING

By Railroads Cuts Earnings of Railway Steel Spring Co.

A large decrease in profits is shown by the annual report of the Railway Steel Spring Co. for the 12 months ended Dec. 31, 1911. Gross earnings fell off $3,874,939, compared with the previous year, and after the payment of the preferred dividend, there was a surplus of $39,787. President F. F. Fitzpatrick, in his report to the stockholders stated that the decrease in earnings was due to the marked curtailment in buying by the railroads in general.

The income account of comparison is as follows:

	1911.	1910.
Gross earnings	$6,160,496	$10,035,435
Mfg., oper. and ad. expt	4,793,481	7,734,535
Depreciation	150,000	350,000
Net earnings	1,217,015	1,950,900
Interest	232,228	195,823
Surplus	984,787	1,755,077
Prefd. dividends	945,000	945,000
Surplus	39,787	810,077
Prev. surplus	3,799,778	2,989,701
Total surplus	3,839,565	3,799,778

Speaking of the company's purchase in the year of the plant of the Inter-Ocean Steel Co., at Chicago, President Fitzpatrick says:

On October 1, 1911, the manufacturing plant of the Inter-Ocean Steel Company was aquired. This plant covers about eighty acres of land at Chicago Heights, Ill., upon which is located a thoroughly modern factory, built and completed during 1909-1910, especially adapted to the manufacture of steel tires and allied products, and is fully equipped with the most improved machinery suitable for such purpose.

For New Process.—The American-Dartium Steel Casting Co., manufacturer of steel castings by what is known as the "Dartium" process, will locate a plant on a plot of ground it has purchased at Seventeenth street and Cookson avenue, Kansas City, Mo. It expects to be in operation by May 1. The new company is capitalized at $150,000, most of the stock being subscribed by Kansas City investors. A building 50 x 95 feet will be first erected but shortly another structure, 80 x 150 feet, will follow. James Morrin Chenhall, an Englishman, inventor of the process, is expected in Kansas City soon, and will design the plant.

Ore Deposit Opened.—The Iron River Ore Co. has opened an ore deposit half a mile from Iron River, Mich., on what is known as the Buchholtz property. The shaft has been sunk 367 feet, cutting a 60-foot vein. Machinery for active mining operations has already been ordered and hoisting operations will probably be begun within six weeks. A test pit was dug 500 feet south of the point where the shaft was sunk and is down 107 feet with the bottom in the same grade of ore. Near the west line of the company's property another concern has operated a diamond drill and struck ore.

American Radiator's Earnings Show Fair

The American Radiator Co. for the year ended Jan. 31, 1912, earned an increase of $114,535 in net profits compared with the previous year. President Clarence M. Wooley reports that despite the business depression, the number of new buildings constructed throughout the country was greater than in the preceding year. During the year a company was organized in Austria and contracts were let for a factory near Vienna which will be in operation early in 1913. The income account shows the following comparisons:

	1912.	1911.
Net profits	$1,312,052	$1,197,517
Prfd. dividends	210,000	210,000
Balance	$1,102,052	$987,517
Common dividends	615,000	569,000
Surplus	$487,052	$418,517
Prev. surplus	5,520,167	4,526,650
Total surplus	$6,007,220	$4,945,167
Surp. fr. sale com. stck.	.....	575,000
P. & L. surplus	$6,007,220	$5,520,167

Oliver Company's Answer.—The Oliver Iron Mining Co. has filed its answer to the injunction proceedings begun some time ago to prevent mining in the Burt and Sellers mines. The suit was started by a woman who claimed that the blasting had affected her health. The answer makes a general denial of the claims set forth and alleges that the suit was prompted by a desire in certain quarters to force the company to buy extensive tracts of property at high prices.

Preparing the Locks.—The employes on the American locks at Sault Ste. Marie began work last week preparing the canal and locks for the opening of the navigation season. The locks are usually ready for boats a week before the first shipper passes through.

The Owen Sound Wire Fence Co., Owen Sound, Ont., advises that the loss to its plant by a recent fire was slight and that operations will be resumed within two weeks or less time.

Plans have been completed for the installation of an incinerating process at No. 3 blast furnace of the Pennsylvania Steel Co., Steelton, Pa.

DIRECTORS ELECTED

John G. Shedd Selected on Directorate of Baldwin Locomotive Works.

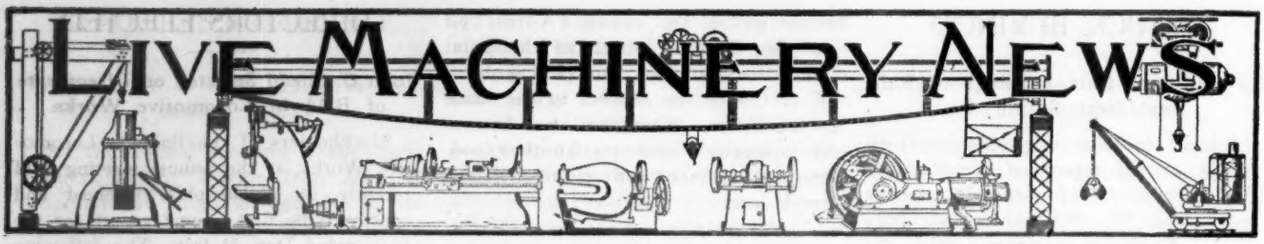
Stockholders of the Baldwin Locomotive Works, at the annual meeting held recently in Philadelphia, received and approved the first annual report for the year ended Dec. 31 last. The following directors were elected: William L. Austin, William Burnham, E. C. Converse, Otis H. Cutler, Thomas de Witt Cuyler, Alba B. Johnson, Samuel McRoberts, Charles D. Norton, Edward T. Stotesbury, Samuel M. Vauclain, Francis M. Weld and John G. Shedd. Mr. Shedd is president of Marshall Field & Co., Chicago, a director of the Illinois Central, the Illinois Trust & Savings bank and the National Bank of Commerce of New York. Inasmuch as he is one of the leading business men of the world and since the Baldwin Locomotive Works has made plans to build a plant in Chicago, special significance is said to be attached to the selection of Mr. Shedd as a director.

Will Start Stripping

Stripping operations on the Mesabi range will be started this month by all the stripping operators except the Oliver Iron Mining Co. The work at the Mahoning mine will probably be carried on with two shovels as soon as the weather permits. The Winston-Dear Co. will put four shovels to work the latter part of this month in the Buffalo and Susquehanna pits.

Agent for Seamless Tubes.—The finished material department of Matthew Addy & Co., Real Estate Trust building, Philadelphia, of which Lewis N. Lukens, recently president of the Longmead Iron Co., is manager, was appointed sole agent for the Detroit Seamless Steel Tubes Co., of Detroit, for New York City and the metropolitan district, taking effect March 1. Matthew Addy & Co. has represented the Detroit Seamless Steel Tubes Co. for eastern Pennsylvania, New Jersey, Delaware and Maryland for some time. In their finished material department they are also sole agents for the Franklin Steel Co., Franklin, Pa., the Cleveland Chain & Mfg. Co. and the Wyoming Shovel Works.

One of the earliest ore docks built at Escanaba, Mich., has just been demolished. It was the No. 1 dock of the Chicago & Northwestern. The timber from the old dock is being used in rebuilding work on the No. 6 dock.



In eastern machinery circles, the most important development last week was the appearance of a large list of machine tool specifications inquired for by the Norfolk & Western. The list, which was put out in Philadelphia, involves an approximate value of $60,000. The important lists of machine tools before the eastern trade now number four and these involve an estimated total of $300,000; it is believed that all of this business will be placed this spring. In Pittsburgh, some large machinery manufacturers report a fair line of inquiry but very little actual business, while the majority complain of a lack of both inquiries and orders. In Cleveland, on the other hand, leading machine tool dealers report that March is the first month since last fall to display any marked improvement and that the outlook for a good month is bright. Some lines of special machinery in that market are selling well. In Chicago, several small lists have been closed for lately; interest in that market is confined chiefly to the smaller lines of tools.

New Construction

The Gerlinger Steel Casting Co., Milwaukee, has started work on the erection of an addition to its foundry, 24 x 75 feet, of frame and brick construction.

A. Y. McDonald Mfg. Co., Dubuque, Ia., is considering the erection of an addition to its plant. The building is to be four stories in height, 100 x 260 feet, and will cost about $75,000.

The Modern Pattern Shop, 12 Sherman street, Detroit, Mich., announces that it has secured a factory at Rivard and Sherman streets, Detroit, and will equip it with new machinery.

The Union Steam Pump Co., Battle Creek, Mich., recently reported as planning to erect a new foundry, advises that it is not doing anything in connection with the matter at present but will take it up later.

The Nichols & Shepard Co., Battle Creek, Mich., manufacturer of threshing machinery, recently reported as preparing plans for a new foundry, advises that the project has been indefinitely postponed.

The Struthers-Wells Co., Warren, Pa., manufacturer of gas engines, gas producers, etc., advises that it is not yet ready to give out complete information respecting the new buildings it proposes to erect.

The Norfolk & Western Railroad Co. last week put out an inquiry among Philadelphia dealers, for shop equipment. The list calls for about $60,000 worth of machine tools. E. T. Burnett, Roanoke, Va., is purchasing agent for the company.

The Dawson Construction Co., Pittsburgh, has taken a contract for the erection of a pattern shop and planing mill for the Pennsylvania Lines west of Columbus. Buildings will be two in number, 90 x 215 feet, and 36 x 105 feet, respectively.

Boyts-Porter & Co., Connellsville, Pa., are planning to build an extension to their mining machinery plant if the borough vacates an unused street adjoining their property. The additions to the buildings will be quite extensive.

The Perth Amboy, N. J., plant of the United States Cartridge Co., 111 Broadway, New York, will be enlarged during this year. Plans are now being prepared and will be announced shortly. The company is a subsidiary of the United Lead Co.

The Sash Hanger Mfg. Co., Beaver, Pa., has decided to build a new plant at Wellsville, O., and bids will be taken this week. The building will be a two-story structure, 60 x 100 feet, and equipped for the manufacture of the company's specialties.

The Goeller Iron Works, Waverly, N. J., is erecting an addition to its plant at Frelinghuysen avenue, Newark, N. J. The new structure will be 100 x 200 feet, and one story high. Steel and corrugated iron are the materials being used.

The Keystone Tube Works, Connellsville, Pa., will start work this week on an addition to its plant to be equipped with machinery for making square tubing. The addition is expected to be ready for operating about April 1.

The Johnstown & Altoona Railway Co., Johnstown, Pa., is preparing to erect a large power house, car barns, machine shop, paint shop and store rooms this spring. Plans are being prepared by Pierce & Barnes, 7 Water street, Boston.

The Ajax Metal Co., Philadelphia, advises that it intends to erect two new factory buildings on a site it has recently purchased. The size of the structures and information concerning the required machinery and equipment cannot be given out as plans have not yet been completed.

Plans are about ready for the proposed annex to the machinery hall of the Carnegie technical schools, Pittsburgh. The building is to be two stories, with basement. The main building is to be 80 x 200 feet, with a wing, 45 x 300 feet, both constructed of brick and terra cotta.

The Kelly & Jones Co., Pittsburgh, are ready to break ground for a four-story addition to their main plant at Greensburg, Pa., which will be 60 x 200 feet, and will be used as a pattern shop and store room for patterns. A barrel making shop will be located in the same building.

The Dairy Machinery & Construction Co., Derby, Conn., advises that it contemplates the erection of a new foundry, but that the work has been held up owing to the severe weather conditions. The company has not yet decided finally on plans or specifications for equipment for the proposed plant.

The East Douglas, Mass., plant of the American Ax & Tool Co. will be moved to Glassport, Pa., where it will be added to the main plant of the company. Announcement of this decision was made this week. The American Ax & Tool Co. is now operating under a new charter known as the Kelly Ax Mfg. Co.

The J. I. Case Threshing Machine Co., Racine, Wis., which has increased its capital stock from $5,000,000 to $40,000,000, has not given out details of its expansion policy further than to say several plant additions will be made. It is generally known that a new gas tractor will be put on the market in 1912.

William J. Knopp, Chicago, has bought for the Oxford Acetylene Co., two acres on Frelinghuysen avenue, Newark, N. J. The company will erect a three-story, fireproof, reinforced concrete, main building, 60 x 400 feet, and an additional structure to be used as a welding building. The company will manufacture standard acetylene generators.

The building of shops for the

conduct of a general steel casting business by the Eagan-Rogers Steel & Iron Co., on the five-acre site recently purchased by the company at Leiperville, Pa., is expected to begin in a few days. The contract has been awarded to the McClintic-Marshall Co., Philadelphia. The company expects to be making steel by May 1.

The W. J. Miles Jr. Mfg. Co., Nashville, Tenn., has been incorporated with $250,000 capital stock, and will shortly erect a plant for the manufacture of malleable iron castings, gray iron castings and possibly machined products. A 10-acre site has been secured, and work on the building will be begun in the near future. W. J. Miles Jr., Middletown, O., is to be president of the new company.

B. L. Dawson, C. K. Hill and R. M. Volk are organizing the Standard Crane Co., of Mansfield, O., and propose building a plant for constructing cranes from five to 100 tons in capacity. The buildings will be of brick and steel, including an erecting shop, 80 x 120 feet, a machine shop, 40 x 60 feet, and a power plant, 25 x 40 feet. Bids on the plant will be taken within a short time.

The Simplex Automobile Co., 614 East Eighty-third street, New York, has awarded the contract for constructing a manufacturing building to Stuart Hirschmann, 200 Broadway, New York. The factory will be erected on Vernon avenue between Eleventh and Twelfth streets, Long Island City, N. Y. It is to be 100 x 200 feet, one story. It will cost approximately $40,000, and will be equipped with considerable metal working machinery, and power apparatus.

Isaac A. Sheppard & Co., proprietors of the Excelsior Stove Works, Philadelphia, manufacturers of furnaces, boilers, ranges, etc., advise that their present plant was sold to the John B. Stetson Co. last September and that they are now erecting a new plant on an eight-acre site on the line of the Pennsylvania railroad, near Frankford Junction, Philadelphia. The plant is to comprise eight buildings which will be ready for occupancy about June 15. The new plant will have a melting capacity of about 45 tons per day. Much of the equipment will be moved from the present plant. Machold & Riddell, Stephen Girard building, Philadelphia, are in charge of the lay-out of the power plant.

The A. L. Swett Iron Works, Medina, N. Y., advises that it is planning to erect a new and up-to-date foundry; the size has not yet been definitely decided on, but it will contain from 25,000 to 35,000 square feet of floor space. The company will not require much new equipment as the present equipment is satisfactory. It will need a cupola with diameter of 64 inches, however, new core ovens and equipment for same, and traveling and jib cranes. In addition to this structure, the company also contemplates erecting a new building for tumbling purposes and the latter will require complete new equipment, including an exhaust system and a sand blast installation. It is possible that these improvements may not be made during the present season.

The Western Implement & Motor Co., Davenport, Ia., has engaged the Leonard Construction Co., 332 South Michigan avenue, Chicago, to draw plans for a new plant for the manufacture of agricultural implements. The plant will include the following structures: Main building, 80 x 1,000 feet; office building, 50 x 80 feet; garage, 20 x 80 feet; foundry, 80 x 500 feet; machine shop, 60 x 500 feet; power plant, 80 x 100 feet; grinding room and foundry storage, 80 x 500 feet; blacksmith shop, 60 x 500 feet; paint shop, 80 x 500 feet; two warehouses, each 80 x 500 feet; oil and paint house, 50 x 80 feet; 100,000-gallon storage tank for naphtha, 100,000-gallon storage tank for fuel oil, 100,000-gallon storage tank on 100-foot tower. Reinforced concrete with sawtooth roofs, is to be the type of construction used on all the buildings, which, with the exception of the office will be one story high, the office being two. The main building, office and foundry will be completed first.

The Worcester Pressed Steel Co., Worcester, Mass., advises that it is planning to erect a new building which it will equip as a rolling mill for cold rolling strip steel. The structure may not be erected before six months and plans have not yet been completed; it will be about 100 x 200 feet of fireproof, concrete, steel and glass construction. At the beginning it will probably be equipped with five stands of rolls from five to 20 inches wide. The company is now completing a new foundry, 21 x 31 feet, of steel and glass construction, to be used for producing high grade steel and semi-steel castings. The foundry is equipped with new Paxson cupolas and the output will consist entirely of special castings for the company's own use. In addition, a new office building, 50 x 100 feet, two stories, is being completed; the space occupied by the present office will be added to the tool and die-making department and will contain the drafting room and the superintendent's office. A large new double action toggle drawing and reducing press has just been installed; this weighs about 200,000 pounds, has a bed area about 60 x 60 inches, and can exert a pressure of about 1,000 tons. Several other presses have recently been installed.

Government News

Contracts have been awarded by the bureau of supplies and accounts, navy department, for furnishing materials and supplies to be delivered to the naval stations named, in accordance with the schedules enumerated, under bids opened on the days indicated, as follows:

Opening Jan. 9.

Schedule 4185, class 35, Philadelphia, one horizontal, automatic hollow chisel mortiser, with compound table, motor-driven: Greenlee Bros. & Co., Rockford, Ill., $634.50.

Opening Jan. 23.

Schedule 4224, class 111, Boston, one cutting-off machine, 4½-inch. Niles-Bement-Pond Co., New York, $690.

Class 112, do., one stationary head drill, 21 inches, power feed, wheel and lever feed, back geared, and fitted with automatic stop: Manning, Maxwell & Moore, New York, $141.50.

Class 113, do., one flat turret lathe, 2¼ x 24 inches: Jones & Lamson Machine Co., Springfield, Vt., $1,439.

Opening Jan. 30.

Schedule 4249, class 41, one 4,300-kilowatt generating set, to be delivered at Brooklyn: General Electric Co., Schenectady, N. Y., $51,500.

Opening Feb. 6.

Schedule 4276, class 119, Philadelphia, 30. pneumatic scaling hammers: W. A. Pate, Washington, $540.

Opening Feb. 13.

Schedule 4263, class 32, Norfolk, one gate shear, with 26-inch throat depth of housings: Hilles & Jones Co., Williamsport, Del., $4,068.

Class 33, Norfolk, Va., one 6-horsepower hydraulic riveter: Camden Iron Works, Camden, N. J., $2,205.

Class 34, do., one motor-driven tube cutting-off machine: Manning, Maxwell & Co., New York, $638.

Schedule 4285, class 41, Philadelphia, two geared pneumatic hoists, 5-ton, 4 strand, each complete with one plain trolley: Ingersoll-Rand Co., New York, $532.

Schedule 4288, class 58, Brooklyn, 120 pneumatic scaling hammers: Wm. A. Pate, Washington, $1,800.

Opening Feb. 20.

Schedule 4298, class 21, Portsmouth, N. H., one standard 34-foot platform car, 60,000 pounds capacity; and 4 standard-gage, 4-wheel push cars: Ernst Wiener & Co., New York, $644.60.

The bureau of supplies and accounts, navy department, will receive proposals, to be opened on the days named, for furnishing materials and supplies, for delivery at the stations named, in accordance with the schedules enumerated, as follows:

Opening April 2.

Furnaces, installing and furnishing, 3, Philadelphia, 4403.

Apparatus, gas producing, 1, Puget Sound, 4405.

Furnishing and installing motor driven pumping outfit, 1, Arlington, Va., 4407.

Hoists, pneumatic, motor, 6, M. I., 4408.

Opening April 16.

Furnishing and installing exhaust blower system, 1, Philadelphia, 4406.

The bureau of supplies and accounts, navy department, Washington, D. C., will receive bids under schedule 4387 for four motors to be delivered at Philadelphia, bids to close April 2.

New Buyers

(In order to assist the post office in delivering letters to new concerns, it is suggested that the names of incorporators be written in the lower left hand part of every envelope addressed to such new companies.)

The following manufacturing concerns have filed articles of incorporation:

The Oil City Iron Works Co., Shreveport, La.; $25,000; by president, R. L. Dobson; secretary, V. M. Dobson.

Illinois Sheet Metal Co., Milford, Ill.; $50,000; to manufacture in wood and metal; by J. A. Murriett, G. F. Patterson, T. C. Herron, Milford.

Woodside Machine Shop, Indianapolis; $2,500; by directors, A. C. Schoen, A. J. Schoen, C. S. Pollard, Harvey Wilhite and Geo. Richart.

Napanee Iron Works, Ltd., Napanee, Ont.; capital, $200,000; provisional directors, John P. Vrooman, John M. Wallace, Edmund J. Roy and T. B. Wallace.

The Belting Co., Cleveland; $15,000; machinery, belting, etc.; by Charles Goehlke, Geo. S. Cole, Geo. O. Willet, Wm. M. Monroe and P. Bredel.

The Economy Tool & Specialty Co., Cleveland; $3,000; to operate a machine shop; by H. J. Owens, Fred W. Stoll, Edward H. Griffith, Mary E. Callahan and Mary C. Callahan.

Power Plant Machinery Co., Cleveland; $1,000; to manufacture power plant machinery and equipment; by George W. Bach, Charles A. Morris, I. Carleton, B. H. Rose, George Gordon.

Central New York Engineering & Equipment Co., Geneva, N. Y.; $100,000; electrical and mechanical engines, etc.; by John H. Sharpe, Geneva, N. Y.; Fred Bowers and Margaret H. Bowers, Penn Yan, N. Y.

Gibson Electrics, Ltd., Toronto; capital, $40,000; to manufacture automobiles and engines, etc.; provisional directors, Neil D. Maclean, Robert M. Hawk, Grace Southwell and others.

Fire Protection Equipment Co., Ltd., Toronto; capital, $50,000; to manufacture fireproof doors, windows, metal lathe, etc.; provisional directors, George D. Perry, Sidney B. McMichael and Stanley V. L. Wilmot.

Ernest Bros. Co., Ltd., Mt. Forest, Ont.; capital, $40,000; to carry on business as iron founders and machinists; provisional directors, John J. Ernst, George L. Ernst and Wm. J. Cleland.

Lorillard Conveyor & Transportation Co., New York City; $10,000; to manufacture conveyors, moving platforms, etc.; by Wm. R. Pitt, 136 West Twenty-fourth street; Raxord Pitt, 136 West Twenty-fourth street; Harry N. Dambmann, 355 West Fifty-fifth street, all of New York city.

General Industrial

P. F. Rolfe has bought from H. A. Davis the latter's machine and pattern shop at St. Joseph, Mich., and has taken charge of the business. He will increase the facilities and improve the building.

The Automobile Forgings Co., Detroit, recently incorporated, announces that it will manufacture automobile forgings, such as body irons, top fittings, lamp brackets, etc., either from blue prints or samples and in a short time will be equipped to make prompt delivery of orders. The company is installing the necessary machinery and tools.

The Everett Steel Flume & Mfg. Co., Basin, Wyo., has been formed to take over the patents of John Everett for steel flumes for irrigation work. The company will be incorporated. The officers are John Bircum Show, president; M. L. Folcey, vice president; W. A. Tilforth, secretary and treasurer; John Everett, manager.

The Trenkamp Stove & Mfg. Co., Cleveland, advises that its capital stock was recently increased in order to take care of additions and improvements throughout the factory. The company recently completed a building of about 180 feet long and 50 feet wide and two stories high. This building was necessary to take care of the increase in the company's business.

The Sectional Threshing Cylinder Co., Spokane, Wash., manufacturer of new time-saving threshing machine cylinders, will start making deliveries May 1. It has just completed its plant at Dishman, Wash., just east of Spokane, which was built at a cost of $25,000. The company is capitalized at $200,000. O. C. Shaw is president, H. S. Schopf is vice president and W. F. Bigelow is secretary and treasurer.

The Petroleo Co., New York, recently incorporated, advises that it has been organized to market an oil engine of entirely new principles and of general characteristics, which, it says, have never before been obtained with an internal combustion engine. No plans have been made for a manufacturing plant and the construction will probably be carried on by contract.

The Neville Iron Co., of Pittsburgh, which was recently incorporated with C. H. McKenny as president, will establish a modern scrap yard, and conduct a general scrap business. The president of the company was formerly identified with the steel hoop department of the Carnegie Steel Co., at the Painter mills. The company has opened offices in the Curry building.

The E. A. Peden Iron & Steel Co., Houston, Tex., has authorized the firm of Hill & Co., architects, to draw up plans and specifications for a building to be erected soon, covering the entire remaining portion of the block now occupied by the Peden Iron & Steel works' offices at Willow and Baker streets, Houston. The new structure will be of reinforced concrete with two stories and a basement and will cover 330 feet on Allen street and 80 feet on Baker street, forming an L.

The Troy Foundry Co., Troy, O., will erect its proposed new building on the site of the old plant, which was damaged by fire. The cupola and part of the equipment, which escaped the flames, will be used in the new structure. Elmer E. Thomson, R. W. Crofoot, Otto Smith and Joseph Blevius, recently elected as directors, will have controlling interest in the company. J. W. Merkle, Jacob Lust and George Miller were re-elected on the directorate. Mr. Thomson was elected president and manager; Mr. Crofoot vice president; Mr. Blevius secretary; Mr. Smith treasurer, and Messrs. Merkle, Thomson and Blevius make up the executive committee.

Trade Notes

The H. W. Johns-Manville Co., New York City, has acquired the exclusive selling rights for the I. P. Frink reflectors and illuminating specialties.